



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

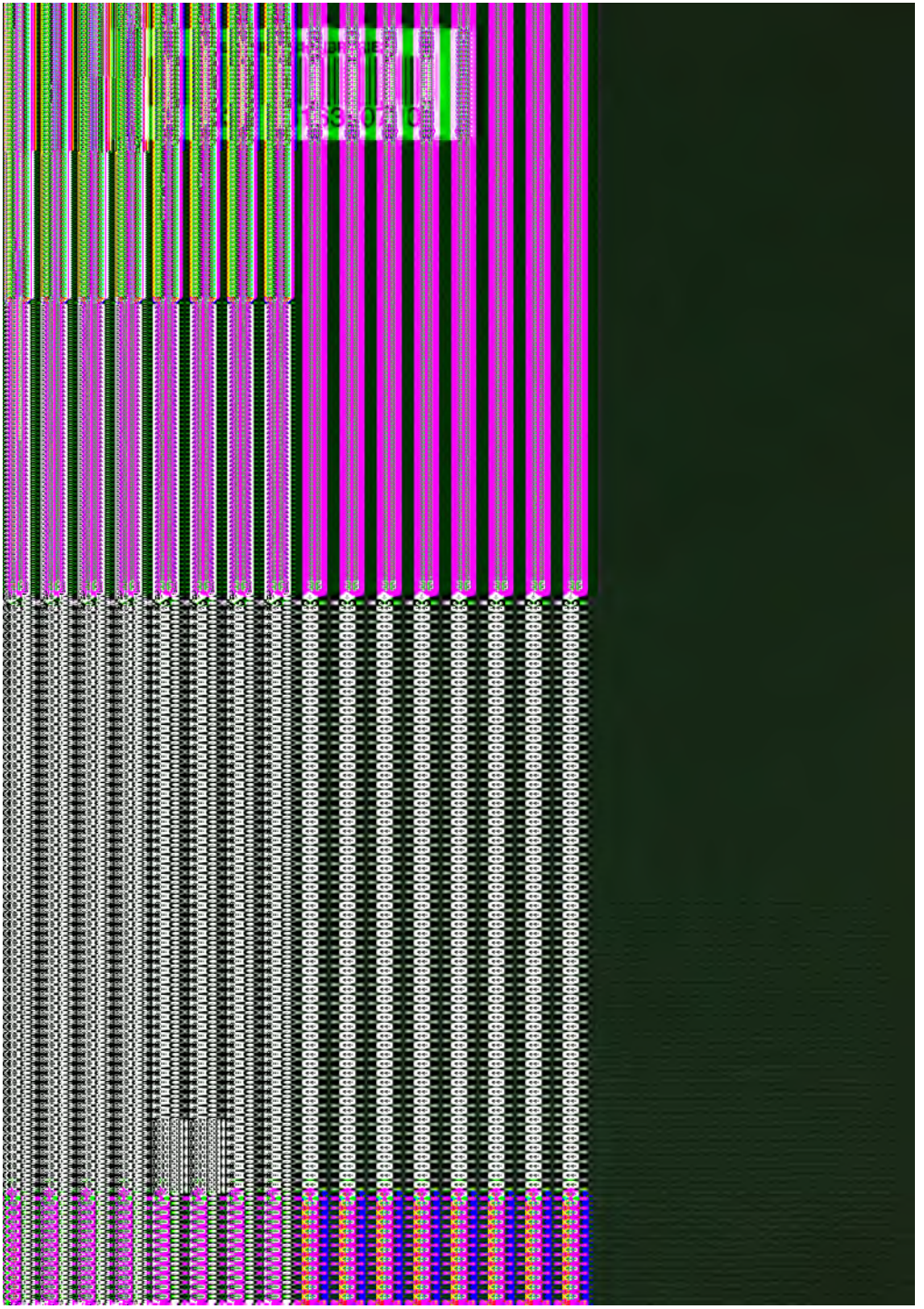
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

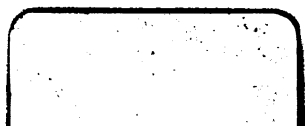
We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





1000
1000

(Termin.)
1524



Re-Creation

A New Aspect of Evolution.

By the Same Author.

EDUCATION AND MODERN
SECULARISM.

With Preface by
THE BISHOP OF SOUTHWARK.

1895.

"A distinctly powerful book. The style is strong and concise, the thought throughout is exact, and the reasoning logical."—*The Guardian*.

"A striking book."—*New York City*.

"The essay, which I think extremely good, hits the point right on the head."—THE BISHOP OF LONDON.

"From the High Churchman's point of view, Mr Formby's argument is able and lucid."—*Daily Chronicle*.

"Should be read by all students of the Education Question."—*Leeds Mercury*.

Re-Creation

A New Aspect of Evolution.

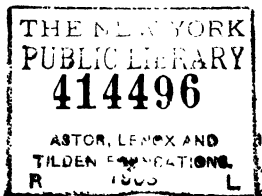
By
The Rev. C. W. Formby, M.A.

"All that lives, lives with one life. If we know
that we share in this, we can wait for the revelation
of its action."

BISHOP WESTCOTT.

London :
Williams & Norgate,
14 Henrietta Street, Covent Garden, W.C.

1907.
M.G.C.
All Rights Reserved.



Contents.

CHAPTER I.

INTRODUCTORY.

Part I.

THE FOUNDATION-WORK OF THE HUMAN BODY.

CHAPTER II.

PHYSICAL LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRINCIPLES.

CHAPTER III.

ÆSTHETIC, SOCIAL, AND OTHER LAWS GUIDING THE UN- CONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRINCIPLES.

CHAPTER IV.

LAWS AND APPARENT ABSENCE OF LAW.

CONTENTS.

Part II.

THE FOUNDATION-WORK OF THE SOCIAL BODY.

CHAPTER V.

SOCIAL, MENTAL, AND OTHER LAWS GUIDING CONSCIOUS
MOVEMENTS TOWARDS THE DEVELOPMENT OF
CIVILISED SOCIETY.

CHAPTER VI.

A RETROGRESSIVE ELEMENT AMID PROGRESSIVE LAWS.

Part III.

THE BIRTH OF THE SPIRITUAL BODY.

CHAPTER VII.

SPIRITUAL RE-CREATION AND THE ORIGIN OF THE SPIRITUAL
BODY THE CHURCH.

CHAPTER VIII.

THE UNITY OF THE RE-CREATIVE PROCESS.

CHAPTER IX.

CONCLUSION.

CONTENTS.

vii

Appendix.

THE TESTIMONY OF NATURAL HISTORY.

CHAPTER I.

THE MAIN PROGRESSIVE MOVEMENT IN THE WORLD
OF NATURE.

CHAPTER II.

SOME SIDE-ISSUES OF THE MAIN MOVEMENT.

CHAPTER III.

THE NATURE OF LIVING MOVEMENTS.

Contents.

CHAPTER I.

INTRODUCTORY.

	PAGES
The need of a deeper insight into evolution—The stimulus of wonder lost to a superficial observer—The danger of a misconception of the process—Definite laws directing living movements—The survival of low organisms—Forewords—Divine selection or natural selection, or both	3-17

Part I.

THE FOUNDATION-WORK OF THE HUMAN BODY.

CHAPTER II.

PHYSICAL LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL LAWS.

Laws and living movements—All organisms are embodiments of law—How physical laws exert their guidance upon living movements—The organic world broken up into different circles of competition—The effect of complete or partial isolation is to exclude the action of forma-

CONTENTS.

ix

tive laws—What the process of killing really involves	PAGES
—How animals acquire the power of killing in battle—	
Human powers of killing—The modern army—Verworn	
and progressive evolution—The true meaning of “The	
survival of the fittest ”	21-51

CHAPTER III.

ÆSTHETIC, SOCIAL, AND OTHER LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL LAWS.

Physical laws are not the only principles which have guided	
the unconscious movements of growth—A period when	
the influence of physical laws was omnipotent—The	
effect of æsthetic principles upon the movements of	
growth—The different actions of natural and sexual	
selection—The effect of social, moral, and spiritual	
laws upon the unconscious movements of growth—A	
retrospective glance	55-76

CHAPTER IV.

LAWS AND APPARENT ABSENCE OF LAWS.

The existence of low organisms a reasonable but not a real	
objection—How the existence of low organisms is ren-	
dered possible—Law and the problem of parasites—Law-	
ful human action viewed as an indirect effect of the	
ruling laws — Law and the survival of injurious	
micro-organisms—Degeneration, its cause and signi-	
ficance	79-95



Re-Creation

A New Aspect of Evolution.

	PAGES
Wallace—Thought and self-consciousness: Tyndall,	
Wallace, Ward—The unity of evolution and the fallacy	
of Unitarian Pantheism—The doctrine of spiritual in-	
fluences and of the Holy Spirit	177-204

CHAPTER IX.

CONCLUSION	207-213
----------------------	---------

Appendix.

THE TESTIMONY OF NATURAL HISTORY.

CHAPTER I.

THE MAIN PROGRESSIVE MOVEMENT IN THE WORLD
OF NATURE.

The embodiment of physical principles giving power to kill	
and resist elimination—The embodiment of chemical	
principles—The embodiment of mechanical principles	
—The embodiment of electrical laws—The embodi-	
ment of laws of light—The embodiment of laws of	
sound—The embodiment of principles of smell, taste,	
and touch	217-234

CHAPTER II.

SOME SIDE-ISSUES OF THE MAIN MOVEMENT.

Partial or complete immunity from the action of stronger	
species gained by a peculiar use of: chemical laws,	
mechanical laws, the laws of light, inaccessible shelters,	
a diminutive size	237-248

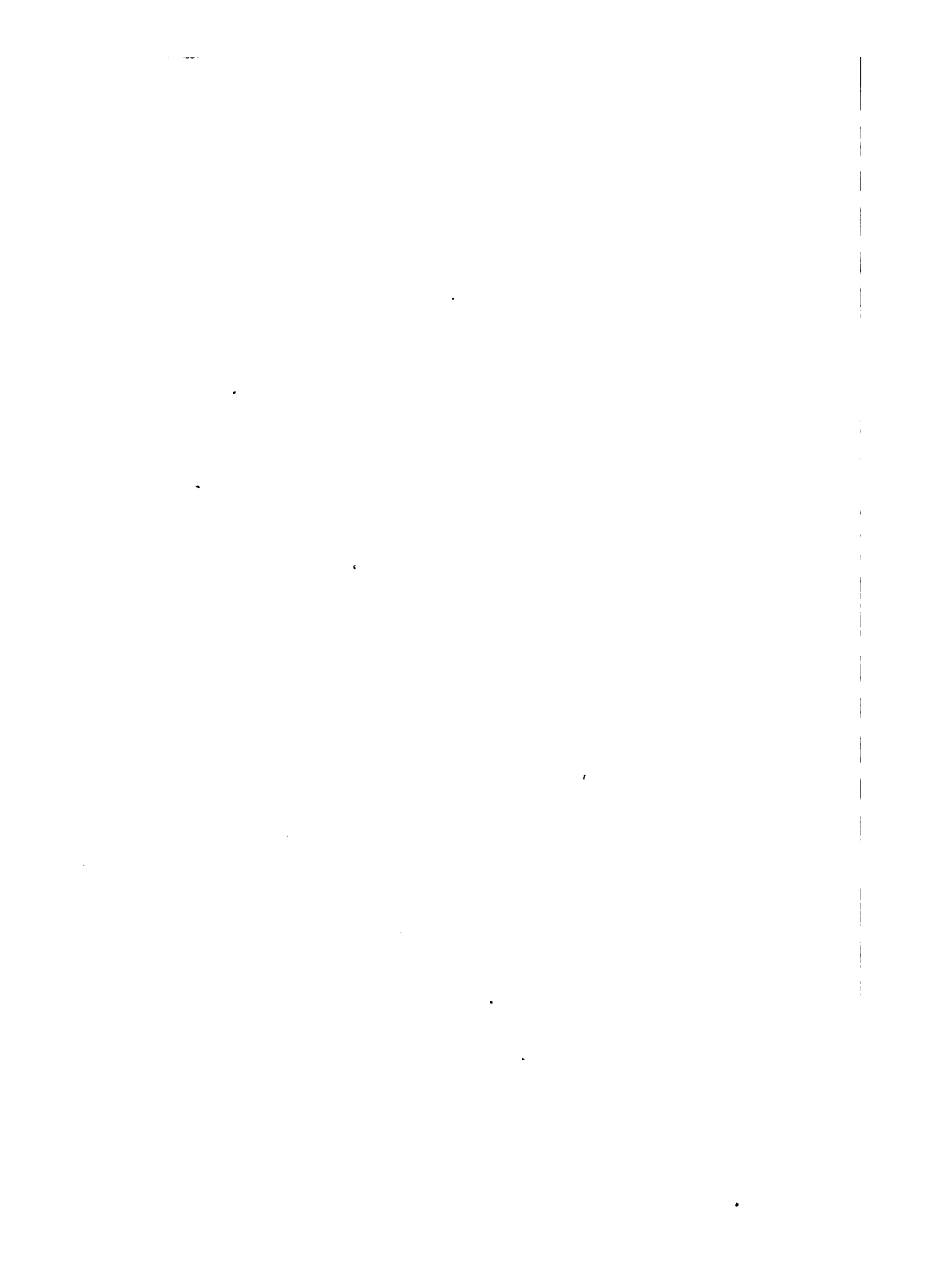
CONTENTS.

xiii

CHAPTER III.

THE NATURE OF LIVING MOVEMENTS.

	PAGES
A comparison between life and the physical forces—Life cannot be produced artificially—It cannot be increased or lessened by addition or subtraction—Organic growth is distinct from crystal growth—The centre of control—The great distinction—Two objections—The transcendent element—Is matter potentially conscious?—Professor Virchow's ideas—Weismann—G. H. Lewes—Kirchener—The verdict left to the future	251-279



Index of References.

WORK.	AUTHOR.	PAGE.
Ascent through Christ, The . . .	Rev. A. Griffith Jones .	131
Christus Consummator . . .	Bp. Westcott .	145, 183
Ecce Homo . . .	Prof. Seeley .	161, 174
Facts of the Moral Life . . .	Prof. Wundt .	196
Faith of the Gospel, The . . .	Canon Mason .	164, 171
Fragments of Science . . .	Prof. Tyndall .	195, 198, 254
General Physiology . . .	Prof. Verworn .	50, 255, 261
Heredity . . .	Prof. Weismann .	274
Huxley Lecture, The (1898) . . .	Prof. Virchow .	269
Mind, Matter, and Monism . . .	Prof. Romanes .	266
Movements of Plants . . .	C. Darwin .	266
Naturalism and Agnosticism . . .	Prof. Ward .	134, 200, 278
Natural Selection . . .	A. R. Wallace .	197, 199
Origin of Language . . .	Dr Farrar .	124
Origin of Species . . .	C. Darwin .	32, 139
Primary Factors of Evolution . . .	Prof. Cope .	267
Principles of Biology . . .	H. Spencer .	25
Psychology . . .	Kirchener .	275
Social Aspects of Christianity . . .	Bp. Westcott .	116, 168
Social Developments under Christian Influence (Donnellan Lectures, 1899)	Rev. M. Kaufmann .	11
Social Evolution . . .	B. Kidd .	158
Unity of Nature . . .	Duke of Argyll .	127, 267, 276
Varieties of Religious Experiences (Gifford Lectures, 1901) . . .	Prof. James .	162, 163, 165, 169

CHAPTER I.
INTRODUCTORY.

Contents.

	PAGE
The stimulus of wonder lost to a superficial observer .	4
The danger of a misconception of the process . .	5
The need of a deeper insight into evolution . . .	7
Definite laws directing living movements . . .	12
The survival of low organisms	12
Forewords and a preliminary outlook	13
Divine selection or natural selection, or both . .	17

"Truth is what all men are seeking. Search after truth is plainly the characteristic of our own times, and in that characteristic lies all the hope of the future."—BISHOP ELLICOTT.

CHAPTER I.

INTRODUCTORY.

IN a recent and remarkable work, entitled, *Let Youth but Know*, the talented writer asserts, that one main object of education is to open the youthful mind to the marvels of the natural system amid which we find ourselves placed, and thus to inspire the spirit of wonder. Now herein lies a great truth. For wonder is a twin sister to interest, and the parent of many blessings. As all teachers know, however dull a pupil may be, if you can only arouse a genuine interest in the subject, the battle is practically won. Where the heart is hot with sympathy and the fire of enthusiasm, the quickening of the brain comes like a gift from heaven. Thus interest,

keenness, eagerness to learn, are very closely allied to that primary inspiration of wonder.

As long as the eyes are awake to the magic machinery of the heavens and earth, and the soul is stirred by its thrilling mystery ; so long the mind thirsts for a fuller understanding. But once let the lamp of wonder go out, and in most cases the ensuing darkness comes on thick and fast, immuring the higher powers in a veritable tomb of stagnation. The mental capacities no longer stretch forth in effort and delight, but sink back into an ever-narrowing horizon, in which the trivialities of life are everything. Then since the influence of wonder is so effective, we might reasonably expect that a great mental stimulus would have been derived from a knowledge of evolution. But as a matter of fact the trend of the prevalent habit of thought during recent years, has been away from the deep and thorough, towards the light and empty. So much so that it has reduced much modern literature to hopeless inanities, and much to that which is worse.

The cause for some of these results is not far

to seek, if we remember that our evolutionary knowledge has been so far given to the public in a form that is neither encouraging nor inspiring. For many an ordinary investigator, the whole miracle is robbed of its wonder and its message by the unfathomed watchword "Natural Selection." What, he asks, is the explanation of all this marvellous panorama of strife and travail?

"Natural Selection," is the answer.

But what has caused the succeeding ages to bring forth higher forms of life? he enquires.

"Oh, Natural Selection," comes the answer again, as ready as it is hopelessly erroneous. And so religious questions of vital importance constantly asked of evolution, are answered in a way which is dangerously misleading, and largely responsible for one of the most terrible curses of our era,—namely, an utter indifference to religion, and a negative attitude to everything spiritual. Wherever a knowledge of evolution has produced this result, it means that the real nature of the process has never been perceived.

Every year, large numbers of young people leave our schools and colleges with a smattering

of evolutionary knowledge. But from what source can they gain a clear notion of what these fragments of information really mean ?

If the seeker after truth consults *The Origin of Species*, or one of the many ordinary hand-books, he will be in imminent danger of receiving the impression that evolution is a mechanical process, caused and accounted for, by natural selection. Whereas, as a matter of fact, Darwin's work can offer no reply either as to the nature of evolution, or the causes which lie beneath it. Nor did Darwin ever intend that it should.

Then in order to gain a true idea as to what kind of a process evolution really is, I propose to begin where Darwin left off, and to enquire into the causes which lie under the result known as natural selection.

Now natural selection is not in itself a *cause*, but is just as much an *effect* of underlying causes as the movement of a watch-hand.

When I look at my second-hand jogging along, I see the motion, but gain from the sight alone, no explanation of the causes beneath.

In the same way, when natural selection shows me some animals being preserved and others being eliminated, it explains nothing, but only puts before me a visible result, namely, the survival of the "fittest." Of the principles underlying this result it tells me nothing.

In the case of the watch-hand I know that the movement is caused by interacting wheels, which derive their power from a mainspring. In addition to this, I understand the mechanical principles by which the wheels affect one another, and the mathematical principles which are embodied in their construction, so that the minutes, seconds, and hours may be recorded. Thus the movements of my watch-hands are no longer a mystery, for I understand the principles upon which their motion depends.

Now in natural selection also, we have before us definite movements; namely, certain living things being killed off, and others being preserved. And these movements work out according to recognizable laws, just as truly as those of a watch. Just as the watch-wheels are effective by reason of their embodying mathematical and mechanical

laws ; so also we shall see that organisms embody various laws, and by virtue of these produce their destined result in the evolutionary process.

Thus the *struggle for life* will be seen to consist of the *interaction* of these different living wheels or embodiments of law ; whilst *natural selection* will be seen to be the *effect* of one particular embodiment upon another.

Then the question is, what are some of the most conspicuous laws embodied in these living wheels, and to what end are these incorporated principles tending with such unremitting persistency ?

The principles we shall trace out extend far beyond the scope of mere bodily development. They lead on to a gradual unveiling of the true nature of the social life of humanity. They show with a clearness obtainable only from a knowledge of the entire system, how essentially spiritual is the structure of human society, and with what danger and injury it is tampered with by legislators who are unconscious of its actual constitution. Surely no knowledge is more essential to the mental equipment of the man of public affairs to-day,

than a sound grasp of true evolutionary principles ; —principles which may be clearly recognized and followed, but which will assuredly avenge every breach of law, whether perpetrated in innocence or indifference. Upon leaders of labour, and upon all who incur the responsibility of swaying masses of public opinion, there rests the bounden duty of ascertaining what they are really doing. The laws of social development are not elastic. Nothing short of disaster may result if the vast momentum of popular vote is drawn unthinkingly to one side, and that the side of error. For if the spirit of truth be absent from the helm, who shall guide the vessel's course ?

Socialistic views increase every year. And the joint life aimed at, and foreseen in such visions, is by no means a deceptive phantom ; but an embodiment foreshadowed by that which has already come to pass. On the other hand, it is easier for the ordinary individual to foresee the blessings of such a unity, than to perceive the roots from which alone these blessings can grow. It is one thing to formulate theories of socialism based upon careful study of economics and

science. It is another to lay hands upon men and women built to fit your theory, and capable of fulfilling their special functions as parts of that theory, and as members one of another. No ! the units must be truly formed for the unity. They must be designed as part of the whole structure ; and He who has designed and made the one, must be allowed to design and make the other.

But in spite of the prevalence of hazy ideas as to what evolution really means, and blindness to the principles by which it must, and will progress ; sooner or later, changes in the direction of some form of socialism are sure to take place.

Will they constitute revolution or evolution ?

If they are forced forward by personal motives and the propaganda of crude materialistic doctrine, in negligent disregard for the true laws of development, they will result, however mildly, in *revolution*. This, as the word betokens, is, motion in a circle ; and whatever the power put into it, must inevitably in the end, leave social conditions very much where they started. But if

the changes proceed from within, like those of true growth, and take shape along the appointed lines, they will result in *evolution* in its deepest sense ; that is, in progressive development.

The truly spiritual nature of human society is no recondite fact, but still the revelations of natural selection throw its peculiar characteristics into the strongest relief. "A celebrated German economist," writes Mr Kaufmann,¹ "has filled four portly volumes² in tracing systematically the resemblances between the structures and functions of animals, or living organisms, and the 'political animal,' as Aristotle calls society. The author referred to is careful, however, to point out that social development follows a higher law ; that society represents a united whole, kept together by *spiritual* bonds, not unlike the mechanical means of cohesion in ordinary organisms, but yet superior to them."

But what do we know either of physical laws or spiritual bonds ?

¹ *Social Development under Christian Influence*, Kaufmann, p. 65.

² *Bau und Leben des socialen Körpers*, von A. E. Fr. Schäffle.

THE REALITY OF THE RULING LAWS.

The reality of the laws which hedge in bodily existence on all sides has never been seriously disputed. Was it not the late Professor Huxley who declared, "Fact I know, and Law I know"? In whatever direction we turn, we find the existence of laws, or definite sequences of cause and effect which no power can alter.

Then once for all let us note the reality of the existing laws, and be prepared to behold their remarkable co-operation in positively urging living matter towards the embodiment of a greater complexity of principles, and thus to higher forms of life.

But the first suggestion of any upward tendency in the ruling laws will evoke the familiar objection: Yes, but how about parasites and the many low types of life which have continued to thrive for ages? Does the existence of these creatures look like laws which make for progress? How could their survival, or the rapid processes of degeneration, take place under the régime of laws making definitely for higher development?

A complete answer will be given in a later chapter. Here, one can only delay to ask a question in reply :—

Civil laws have not prevented the existence of thieves, nor the prosperity of idlers. Are we therefore to conclude that civil laws neither exist, nor have any beneficent aim or tendency ?

Then the object of the following pages is not only to show that evolution is the work of co-operating laws whose marvellous adjustment bears every possible sign of purpose ; but to demonstrate the actual manner in which these laws have effected their various functions. It is one thing to surmise that beneath the medley of interacting beings there may be a Divine purpose, in spite of appearances. It is quite another to be able to recognize that purpose running throughout the whole, to be able to follow out the steps and methods by which its details are accomplished, and to perceive the true relationship between the phenomena of natural history and the essential doctrines of revealed religion. Moreover, it is the twofold identity of aim and operation, which, being seen to exist through-

out evolution, should render its meaning distinct and certain.

Just as, in watching the manufacture of some complex instrument, we are led from one workshop to another, and the operations of each reveal some further details of the whole design ; until the additions carried out in the last room give unity to our ideas, explaining the whole, and casting light upon all former stages ; so the earlier phenomena of evolution will be found to surrender their full explanation in the more unmistakable facts of their consummation. One portion of a process taken by itself may be readily misunderstood, but its characteristics become perfectly evident, when they have been traced through all subsequent stages, and verified by their effect upon the resulting product.

Then first and foremost, a deep introspection into the factors of the selective machinery will show, that so far from being mechanical, evolution bears every mark of what can only be described as a spiritual process. It will be found to consist of the gradual embodiment in material form of various complex principles which are

recognizable in the abstract and ultimately explained by evolutionary results.

Whatever may have been the origin of the living element, it displays, indistinctly at first, but unequivocally in later stages, characteristics not of mechanism but of soul.

Although the true significance of the word "re-creation," cannot be presented here, neither adequate explanation given, nor full evidence unfolded, until the whole subject has been dealt with ; still it would be well to state at the outset, that the gradual development of animal types with which we are familiar under the name of organic evolution, does not represent re-creation itself, but only constitutes the earlier stages of this operation.

It is only when the principles underlying this complicated mass of living creatures are examined carefully, that the actual phenomena reveal plainly the purpose of the laws which they embody.

The wondrous manner in which living embodiments, becoming more and more complex, have been gradually impelled into being, can

surely never be adequately described in words.

Short of moulding the plastic substance of living matter into human form by some impossible outward operation, as the potter fashions the clay, the imagination could scarcely picture a more infallible and irresistible method of directing the unconscious movements of growth, than that which is laid bare by uncovering the machinery of the selective processes.

One change of thought demanded by a clear understanding of evolution is the obliteration of every taint of *aimless* cruelty in our conception of "Nature red in tooth and claw." Red indeed she is, but only with the sweat of creation. Cruel too she is, but the cause of her cruelty cannot be mistaken, and it is not aimless.

Enough and far more than enough has been written about the martyrdom of man, and nature's aimless cruelty to her offspring. The imputation is not justified by facts. But whereas for ages the human mind seems to have perceived in sacrificial ceremony some deep

connection between killing and the mysteries of bodily existence ; so as the veil is lifted little by little from the secrets of animal interaction, its killing is plainly recognized as a factor turned to good account by the ruling laws ; and as a means by which these laws have wrested from living movements every possible advantage for their ultimate purpose.

Although the formative processes unveiled in the following chapters will be seen to have admitted deviations from the forward line of evolution, still they would appear to be more truly described as "Divine Selection," than merely as "Natural Selection." Indeed, the watchword *Divine Selection*, may well be kept in mind throughout these pages, with a view to ascertaining if the selective processes be not Divine as well as natural.

But to turn from these more general remarks to an examination of the actual facts lying beneath the selective processes ; which facts each individual must consider, and judge of for himself.

Part I.

THE FOUNDATION-WORK OF THE HUMAN BODY.

CHAPTER II.

PHYSICAL LAWS GUIDING THE UNCONSCIOUS MOVE- MENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRINCIPLES.

Contents.

	PAGE
Laws and living movements	23
All organisms are embodiments of law, Spencer	24
How physical laws have exerted their guidance upon living movements	26
The organic world broken up into different circles of competition	31
The effect of complete or partial isolation is to exclude the action of formative laws.	33
What the process of killing really involves	35
How animals acquire the power of killing in battle, and of resisting elimination	38
Human powers of killing	43
The modern army	44
The meaning of "The survival of the fittest"	46
Verworn and progressive evolution	50

"Such a body, and then such an earth for insphering the whole."—BROWNING.

CHAPTER II.

PHYSICAL LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRIN- CIPLES.

WE know that in the past history of evolution unconscious¹ movements have taken place in very great variety in living matter, giving rise to an equally large variety of growths and beings. Let us now watch the fingers of the ruling laws as in their secrecy they mould this growing matter into the designed form and structure.

The action of these laws may be briefly

¹ Although a potential consciousness may belong to all living movements, we can avoid all risk of error, and gain all the clearness required, by taking all movements to be unconscious which are not obviously the result of human reasoning.

summed up as follows. They have stopped some living movements with peremptory decision, whilst others have been allowed to continue, and caused to increase in complexity, until they have resulted in the human body. This process of sifting and guiding the movements of growth has been effected by the ruling laws in two ways, as seen in natural selection.

First, directly, through the agency of inorganic causes, such as change of temperature, drought, etc., bringing about the death of individuals and the extinction of the family and species.

Secondly, indirectly, through the agency of living beings in the competition for food and females, producing the same result of death and elimination.

In the first case, where the movements have been arrested by lifeless causes, the effect of the ruling physical laws is obvious.

In the second case, where the extinction has been worked out in competition through the agency of other animals, the unerring action of the guiding laws is not so easily followed. Yet as a matter of fact we shall see that their direct-

GUIDANCE BY PHYSICAL LAWS. 23

ing potency is as paramount in this, as in the former kind of selection.

Thus, by perpetually deciding what movements shall not thrive and continue to spread, as well as by fostering those which coincide with certain definite principles, this wonderful set of laws has brooded over every living movement for untold ages, until the tangled mass of motion has unfolded into the issues of the present hour.

The spectacle of this complex network of invisible laws gradually becoming embodied in visible bodily development, is one of absorbing interest.

But to approach the subject more closely and observe how this embodiment takes place.

It is clear that all movements of growth proceed in accordance with physical principles. All tissues and structures are built in more or less strict conformity to chemical, mechanical, and other recognizable laws.

An engineer needs to study various branches of mathematics and science for years, before he can build a bridge which shall embody the different principles upon which its efficiency

depends, with perfect accuracy ; giving a maximum of strength with no superfluous weight. And yet these principles, and many others as well, will be found embodied with the greatest perfection in the skeletons of many common birds. It is perfectly certain then, that—

ALL ORGANISMS ARE EMBODIMENTS OF LAW.

The eye of the higher animals is a complex embodiment of the laws of light. The ear in the same way is constructed in accordance with the laws of sound ; whilst the heart, lungs, and other internal organs afford a close correspondence to the chemical, thermal, and other principles by means of which their functions are rendered possible.

It would be beside our purpose to deal with this extensive subject in detail. A comparatively full discussion will be found in Mr Herbert Spencer's chapters on the Morphological Development of Plants and Animals.

He points out very clearly, with the aid of diagrams, how the various structures of living things have come to embody definite physical

GUIDANCE BY PHYSICAL LAWS. 25

principles which may be recognized and tested experimentally. For instance, when describing the development of tubular structures such as the stalks of plants, the shafts of feathers, and cylindrical bones, he remarks:¹ "A thin layer of substance gains greatly in power of resisting a transverse strain, if it is bent round so as to form a tube :—witness the difference between the pliability of a sheet of paper when outspread, and the rigidity of the same sheet of paper when rolled up. Engineers constantly recognize this truth, in devising appliances by which the greatest strength shall be obtained at the smallest cost of material ; and among organisms, we see that natural selection habitually establishes structures conforming to the same principle, wherever lightness and stiffness are to be combined. The cylindrical bones of mammals and birds, and the hollow shafts of feathers, are examples."

In the same way Mr Spencer traces the vertebral structure and the shape of vertebrate skeletons to the action of physical principles. Then an investigation into the facts of Morphology

¹ *Principles of Biology*, vol. ii. p. 53.

and Physiology shows, that in a true sense, all living beings are embodiments of law.

Now, what happens when these living embodiments come into competition ?

The facts of natural selection give the answer. And in doing so they demonstrate,—

*HOW PHYSICAL LAWS HAVE EXERTED THEIR
GUIDING POWER UPON THE MOVEMENTS
OF GROWTH.*

For natural selection shows that if living movements result in an imperfect growth—that is to say, a limb or organ which is not formed in strict accordance with certain physical laws—the normal effect will be, that sooner or later in the struggle for life its owner will be eliminated by an individual of more perfect construction.

In other words, when the living embodiments of laws come into competition, it is really the laws upon which they are built which decide their contests. The animal which is the fuller and better-balanced embodiment of the laws which are appealed to in battle, is the animal which survives and continues to propagate the move-

GUIDANCE BY PHYSICAL LAWS. 27

ments which led to its own existence. But the guiding laws do their work more thoroughly still. For not only do they sweep away the rejected growth, germ and stock, but they effect through heredity a propagation of the selected movements.

Thus, by rendering some movements impossible even to start, by arresting some when they have begun, by placing the premium of survival upon others ;—physical laws have persistently directed the hidden motions of both growth and germinal activity.

This cursory glance at the machinery of natural selection has so far shown us, that when the living wheels embodying various principles interact, that is to say, come into competition ; the action of the embodied laws is, to aid some movements, and to eliminate others altogether.

It is perhaps scarcely possible at this juncture, to perceive the extremely purposeful aspect which this machinery wears when it is viewed from end to end ; and when the action of the laws embodied in its later products is recognized. For let no man suppose that the effects of *physical* principles only are visible in the

workshop of evolution. At every turn the formative action of purely physical principles is seen to be modified by the effect of laws of a more transcendent character. Thus, the laws dictating the limits of the bodily size and shape of animals, will be found to be supplemented or partially counteracted by laws regulating the possibilities of mental growth, or by laws of colour and sound, producing a marked effect upon structure and capacity ; or yet again, by that peculiar set of principles which puts such a premium upon gregarious and social habits.

The precision with which the embodied laws have worked out the minutest details of organization is very significant. Take, for instance, the composition of the blood of mammals, or any of the numerous chemical compositions which are so necessary to the structure and functions of the sense organs or digestive glands. How can anyone who understands the selective processes regard these as chance combinations ? Even if we assign their origin to chance, chance is at once forbidden. For the very fact that the particular compounds which exist to-day in the human body have won

GUIDANCE BY PHYSICAL LAWS. 29

survival among a great variety of others, proves that these particular compounds have a special relationship to a set of laws of extraordinary complexity ;—a relationship not only to physical laws, but to all the complex demands made upon them by the endless principles embodied in a highly developed brain and nervous system. One cannot therefore ascribe the preservation and perfecting of progressive features to chance, for natural selection has proved that there is no margin for variation from the standard of perfection, where the animal has to live amid the keenest competition.

For instance, what kind of blood or bone radically different from the normal existing type has ever stood the tests appointed for the survival of man ? Want of lime in bones, lack of iron in blood, defective gastric secretions, are instances of variations which the ruling laws have always forbidden, and are always ready to arrest.

And if we pass from the substances to the form and structure of the higher mammals, the same truth is prominent. Over the perpetual contests of bygone eras, fixed co-operating prin-

ciples have always watched as joint-arbitrators of vital issues. Before the tribunal of many physical and other laws, the question as to the size, shape, and organization of the ruling animals has been raging for untold centuries ; but the countless mechanical, social, mental, and other principles which have presided over the battlefields, have only found their more final expression of recent years in the human form.

Then the struggle for life, and the selective processes unveiled by Darwin, consist in reality of various laws becoming embodied in living beings, and working out a definite formative effect upon organic development.

It is the conjoint action and supreme authority of these laws, coupled with the definiteness of their demands, which render the theory of aimless chance quite untenable.

From this preliminary outlook, it may seem that the guiding influence which these co-operating laws have exerted upon evolution ought to be capable of very easy demonstration. But as a matter of fact the subject is rendered very complicated by the curious way in which,—

*THE ORGANIC WORLD IS BROKEN UP INTO
DIFFERENT CIRCLES OF COMPETITION.*

For if all living things had from the beginning met in open competition, if there had never been any possibility of small and weak animals hiding in holes and crevices, and if parasites had never been able to shield themselves by their unapproachable refuges ; the most perfect embodiments would have won their supremacy at once, and organic development would have proceeded in one straight line. But, as everyone knows, perfectly open competition among living beings has been impossible and non-existent. The whole organic world is cut up into separate groups of competitors. Every species has its own foes. All readily use some kind of physical force against their rivals, but nearly all dread the arbitration of battle wherever there is prospect of defeat. Consequently flight and concealment are resorted to on all sides. The rugged surface of the earth, the shelter afforded by trees and vegetation, both play a part in the practical isolation of certain species. The same result is

brought about by the darkness of night, by powers of rapid locomotion, by a deceptive appearance, by being possessed of a repulsive odour or taste, by a minute size, or by other causes.

Now for the effects of these means of isolation.

First, that every square yard of this earth teems with living things which have survived, not because they possess sufficient bodily development either to kill higher animals, or to resist being killed by them ; but because, for one or more of the reasons just mentioned, they have escaped all contest and interaction with superior species.

Secondly, a further effect is, that in escaping competition these creatures have avoided the action of the very laws which would have either led to their development or caused their elimination. The remarkable way in which the powers of one species affect the evolution of others did not escape the observation of Darwin. Although he did not touch upon the actual causes, he remarked upon the fact in these words :—¹

“ A corollary of the highest importance may be deduced from the foregoing remarks, namely,

Origin of Species, p. 55, sixth edition.

GUIDANCE BY PHYSICAL LAWS. 33

that the structure of every organic being is related in the most essential yet often hidden manner to that of all other organic beings, with which it comes into competition for food or residence, or on which it preys."

The explanation of this fact is readily forthcoming from the truths just stated—namely, that the mechanical, chemical, and other physical principles which hold sway on this planet, exercise a definite formative effect upon animal development *through the agency of other beings* in whom these laws are embodied. It follows of necessity, that when any species escapes contact and interaction with others, it escapes also the effect of laws which in the course of years would exert an enormous formative effect upon its structure and capacity.

THE EXCLUSION OF THE ACTION OF THE FORMATIVE LAWS.

Thus laws which have closely guided the development of some species, have remained entirely powerless to reach others ; simply because some form of isolation has kept out the agency

of higher animals, thereby excluding the laws which they embody.

For instance, the laws of locomotion which have decided the fate of millions of birds and animals, have had no direct influence upon the motionless members of the vegetable kingdom. Again, the laws of sight, so vitally important to the survival of innumerable other living things, have affected these sightless beings only through the agency of birds and insects.

The facts of sexual selection prove that the evolutionary fate of some species has been in part decided by the laws of the beautiful in sight and sound ; whereas that of others has remained totally unaffected by any influence of the kind. Again, the laws of abstract mental process, of such vast importance in guiding human evolution, have had little similar direct effect upon the course of animal development.

It is evident, then, that many of the laws which have guided evolution have remained potential, until the birth of some animal embodying them has brought them into effective activity as factors in the struggle for life.

GUIDANCE BY PHYSICAL LAWS. 35

If this inspection into the machinery of natural selection does nothing else, it will reveal, later on, the actual manner in which parasites have secured their foothold in the organic world.

Let us now turn to any of the groups of competition found in the world of nature, and notice—

WHAT THE PROCESS OF KILLING REALLY INVOLVES.

The perpetual killing which is such a persistent phenomenon in the interaction of living beings, is not the aimless casual occurrence which at first sight is apparent. Power of killing and of self-defence are always gained by animals in accordance with universal laws.

At the outset, let us notice that there are three distinct ways in which killing takes place :—

First, there is the killing which occurs in open battle in contests for food or females.

Secondly, there is the killing by parasites and disease-germs.

Thirdly, there is the simple crowding out

from air, food, or moisture, which takes place among plants.

This last process is confined chiefly to the vegetable kingdom, and is not likely to confuse our ideas of evolution. But it is of the greatest importance that we should note clearly the radical difference between the first two.

KILLING IN OPEN COMPETITION

is the unrestricted interaction of various embodiments of law. The results which are worked out in these contests are really the outcome of the numerous co-operating laws which have been appealed to in the course of warfare. Thus it is competitive killing only, which results in that forward movement which is such a prominent feature of evolution.

KILLING BY PARASITES OR BY LOW ORGANISMS

is something totally different, as we shall see when this subject comes to the fore. The attacker in these cases does not win because it is the stronger or the more complete embodi-

GUIDANCE BY PHYSICAL LAWS. 37

ment of laws ; but because, in spite of having no adequate power of resisting force, it has some special means of shelter, and as a rule only produces death by the onslaught of great numbers.

Thus, for the simple reason that this kind of killing is not the work of the more perfect embodiments of laws, and therefore has brought no higher laws more closely to bear upon the unconscious movements of growth, it has exerted but little effect upon organic development, and can never be considered more than a side-issue of the great central evolutionary movement.

But killing in battle is something very different. When we remember that this kind of killing on the one hand, and the prevention of reproduction on the other, are the two chief methods by which the laws of nature sifted out and guided the unconscious movements of growth until they reached the complex structure of the human organization ; we shall realize the importance of understanding both these processes very clearly.

Then confining ourselves to killing in open competition, let us see—

*HOW ANIMALS ACQUIRE THE POWER OF
KILLING.*

On approaching this extensive subject, carrying us, as of necessity it must, into the details of natural history, we should be careful not to lose sight of the ultimate object of our enquiry ; which is to notice the guiding fingers of law beneath the interminable interaction of living beings. Killing and other mysterious processes of nature, are only too liable to misjudgment, on account of possessing features which are not what they seem. Aimless chance, hideous cruelty, and ultimate chaos, so prominent at first glance ; melt into beauty and wondrous design upon closer inspection. Then with regard to the question before us, animals possess the power of killing and resisting elimination, in proportion to the *extent* to which their organizations embody mechanical, chemical, social, and other principles, and the *manner* in which they embody them. For instance, all bodily growth in animals, however simple the structure, entails the incorporation

GUIDANCE BY PHYSICAL LAWS. 39

of some definite physical principles with the organized matter. This embodiment confers a certain capacity for exerting some kind of physical energy, even if it be only the possession of weight. The mere growth of muscle and bone, means only the embodiment of the simpler physical principles, and consequently gives only a capacity for exerting brute force. Mental development, on the other hand, means the embodiment of countless subtle laws, bringing with it the power of utilizing the resources of nature outside those of bodily structure.

Thus, as soon as a few primary laws of intelligence had become embodied in the brain of the ape, he became able to use stones and sticks in self-defence, increasing very considerably his powers of killing and of resisting attack.

It is a significant fact, that although killing is essentially a bodily process, carried out by such material weapons as tooth and claw, it is in some cases effected through the agency of principles of a most immaterial character, such as social laws. For instance, a gregarious species greatly increases its power of killing or of resisting

elimination by the embodiment of the simple social law of co-operation.

A wild boar would make short work of one hound, for in spite of his unwieldy proportions, he embodies certain physical principles of strength more fully than his opponent. But what chance has he against a pack? For each hound has on his side the weight and biting capacity of all the rest. In such cases it is clear that the factor which gives the increased power of exerting physical force, is the embodiment of the simple law of co-operation.

Here again is an example of another embodiment of a social principle, giving a great additional power,—this time a power of utilizing the laws of sight and sound. A flock of curlews are feeding: a note of warning from one member sets them all on the wing long before the danger arrives. Thus by no superior bodily development, but by the incorporation of a simple social principle, a flock of ten curlews has as good a chance as if it were one single organism possessed of twenty eyes, and as many ears, turned in all directions.

GUIDANCE BY PHYSICAL LAWS. 41

From these brief instances it will be seen, that a certain control or use of natural forces lies at the disposal of living beings, not only in proportion to the way in which *physical* laws are incorporated in their bodies ; but also according to the way in which *social* or even *mental* laws are embodied in their brains.

If we were to step out into the world of nature and examine the various means by which birds, beasts, and fishes kill and avoid being killed, we should find that they consist of many curious and varied embodiments of existing laws. Among the medley of adopted contrivances, we should be able to distinguish the uses made of chemical, electrical, mechanical, and other recognizable principles. There too, we should find principles of light, sound, touch, taste, and smell embodied in different ways ; but all turned to account in the struggle for life.

Under other circumstances it would be allowable to make a digression here, and to wander off into the byways of natural history, investigating somewhat in detail the various methods of killing and resisting elimination. But in order

to bring forward more important issues without delay, I have relegated to the Appendix the chapters concerned with natural history. I have given there a few typical instances of the way in which that extremely complex combination of laws which has been the parent of the human body, has also allowed or fostered types of living beings which are by no means complete embodiments of the principles which those laws contain.

But with regard to the subject before us, it can be brought to a close most rapidly by stating two principles which underlie the process of killing in battle, and which show how closely it is governed by the existing laws.

The first principle is,—that in open interaction, an animal's power of killing and resisting elimination depends upon its own power of using the physical energies of nature, as compared with that possessed by its rival.

The second principle is,—that this power of using physical energy depends upon the way in which physical, social, mental, and other laws are embodied in their organizations.

GUIDANCE BY PHYSICAL LAWS. 43

In other words, in case of active conflict, those animals which constitute the closer and fuller embodiment of a complex set of laws which govern evolution, have the power of eliminating those which accord a conformity less complete and less balanced.

In order to make this clearer, let us leave our discussion of unconscious movements, and notice how obvious these two principles appear in human evolution. In dealing with human evolution, we are in the realm of conscious action. Here, free-will is real, but man's doings are nevertheless strictly watched over and guided by the laws of his Maker.

HUMAN POWERS OF KILLING.

Then man's power of killing depends upon his capacity for using physical energy as compared with that possessed by rivals. And this power depends upon the extent to which certain laws are incorporated in the bodies, brains, and *characters* of the combatants themselves.

We noticed that the lower animals have gained their power of killing by the incorporation of

various principles into their *own bodies*. With man, the laws made use of are chiefly embodied in the brain, and given material expression in the manufacture of *artificial weapons*.

There could be no object in enumerating the various ways in which man has acquired the power of killing and resisting attack by assimilating endless physical and other laws. The story has been the same from prehistoric ages to the present day. It is a very very long one, but we can cut it short by taking a glance at that emblem of death and survival—a modern army.

We shall see there, proofs of the great principle which is equally true in every stage of evolution ; that the power of killing and controlling others belongs to those who embody most perfectly a certain set of laws. In the case of man, these laws are not physical only, but laws which involve mental, moral, social, and spiritual principles as well,—laws which have not yet found their full expression in any example of that most complex growth, modern civilization.

If it would be impossible to enumerate the countless principles which preside over such a

GUIDANCE BY PHYSICAL LAWS. 45

simple conflict as that between two dogs in the street ; what shall we say of the vast network of laws which must be embodied in any modern army taking the field against a European foe, with reasonable hope of victory ? We may leave out of sight the towns, cities, and villages of the homeland ; that law-abiding social fabric, which alone could support such a force by its size and wealth. We turn to the brigades of well-drilled soldiers, the equipment of guns, carriages, explosives, balloons, scientific instruments, engines, telegraphic and telephonic apparatus, surgical appliances, commissariat stores, and endless additional necessities ; and as yet we have scarcely touched upon the barest outline of the factors of an army. True, the necessities named embody almost every known physical principle, but the matter does not end here. For if an army is to stand the test of a trying campaign, it must constitute a thorough embodiment of very many laws higher than physical ones. It must be permeated through and through by principles of discipline, loyalty, and devotion ; and there must be a genuine response to the laws of courage and spiritual enthusiasm.

In short, the victorious armies of the future will be the most perfect embodiments, not only of *physical* laws, but of all the transcendent *spiritual* principles which govern man's higher nature.

It would seem then, from the foregoing facts, that the process of killing by competing animals has been a most important factor in directing the unconscious movements of growth, constituting nothing less than a bringing into effective action the guiding potency of numerous co-operating principles.

Before passing on to watch the formative action of other laws, it would be well to ascertain the true meaning of that common but deceptive phrase, "The survival of the fittest."

*THE MEANING OF "THE SURVIVAL OF THE
FITTEST."*

Since the word "fittest" always refers to the particular surroundings of each different animal to which the term is applied, it becomes a term of extreme ambiguity, being based upon no fixed conception whatever. The surround-

GUIDANCE BY PHYSICAL LAWS. 47

ings of every species differ, and sometimes very greatly, so that the same feature which constitutes "fitness" in one animal may constitute unfitness in another.

On the other hand, both an earth-worm and a human being must be included among the "fittest" according to current usage of this expression, because both still survive extinction.

But does not "fitness" denote something a thousand times more complex in the one case than in the other?

Here is another paradox connected with the current use of this phrase. Every living animal is *one* of the fittest, but none is specified—certainly not man—as "*the fittest*."

What is the explanation?

The fact is, that the word "fittest" is a superlative term, but is commonly used without any fixed ground for a comparison.

I am told that the earth-worm is one of the fittest because it survives. I ask, fittest in respect of what?

The answer is, fittest compared with the

members of the small group of organisms which have been the competitors of its ancestors, or its own rivals, and which it has outlived.

In no case does the word "fittest" imply any relation to the hosts of animals outside this little circle of competition. Consequently, no one species can be said to be the fittest of all those in existence ; because it is supposed that no one species has ever met all the others in the struggle for life.

Now all this may be very true as far as it goes, but it stops short of the whole truth. For it is obvious that man has come into contact with practically all other species, and up to the present has proved himself capable of surviving.

Then man may be called "the fittest" in an unqualified sense, and in a sense which is not true of any other animal. In fact, the real point of difference is this :—

The fitness of other animals depends only upon the comparatively few laws embodied in their narrow circle of competitors.

GUIDANCE BY PHYSICAL LAWS. 49

The fitness of man depends upon conformity to all the laws which govern bodily existence, and which are embodied by any living being between the two poles.

Man may therefore truly be said to be "*the* fittest," because his fitness is absolute, having reference to all the laws which have influenced the course of evolution.

Now, although the indiscriminate use of the term "fit" is permissible, the superlative "fittest" can only have one true meaning. There is only one being which is fittest in regard to all the laws which condition bodily existence, and that being is man. We have seen that whenever the term "fittest" is applied to other animals it is used of necessity in a restricted sense. It is obvious then, that the indiscriminate use of a superlative term in a restricted sense is inaccurate, and likely to lead to confusion and untruth.

In this connection it may be interesting to notice an objection which has been made to regarding evolution as progressive, and man as the most perfect of its products.

*THE PROGRESSIVE NATURE OF EVOLUTIONAL
DEVELOPMENT.*

For instance, Professor Verworn has stated his opinion in the following words :—"This idea [the idea of evolution being progressive] embraces an error which it was the whole endeavour of the Darwinian theory to avoid, viz. that of teleology. . . . The employment, therefore, of an idea of advance or perfecting is evidence merely of an anthropocentric standpoint ; . . . the assumption that mankind is more perfect than an amœba is not justified by reality." ¹

Now, can we possibly accept this as a reasonable or sound observation ? The correspondence which man shows to the complex laws which condition evolution, is so incomparably fuller, closer, and more final than that of any other organism, that to question man's superiority and supremacy would be to fling to the winds the testimony of facts, of the senses, and of reason. Terrible indeed must be the straits ahead, before

¹ *General Physiology*, p. 318.

GUIDANCE BY PHYSICAL LAWS. 51

reason and intelligence can be forced back upon such a remarkable position.

Until the amœba begins to oust man from his place at the head of all living beings, until it not only obtains a fuller control of the forces of nature, and conquers him in the struggle for life, but also becomes his substitute in factory and laboratory ; we shall be compelled to own that the Professor's remarks are as yet, scarcely verified by all the facts of nature.

100

100

CHAPTER III.

ÆSTHETIC, SOCIAL, AND OTHER LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRINCIPLES.

Contents.

	PAGE
Physical laws are not the only principles which have guided unconscious movements	57
A period when physical laws were more omnipotent	57
The effect of æsthetic principles upon the movements of growth	58
The different actions of natural and sexual selection	59
The effect of social, moral, and spiritual laws upon the unconscious movements of growth	62
The effect of mental and spiritual laws upon the un- conscious movements of growth	68
A retrospective glance	74

"Ally yourselves with the tendencies of God's universe, and do the thing which will last for ever."—MACLAREN.

CHAPTER III.

ÆSTHETIC, SOCIAL, AND OTHER LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH TOWARDS THE EMBODYING OF PHYSICAL PRINCIPLES.

THE spectacle which has in part passed before our eyes when glancing over the battlefields of nature, has been that of physical laws laying down the foundation outlines of the human body.

What process of creation could be more wonderful, or more impressively eloquent of the exalted majesty of the Great Lawgiver, who thus standing afar off behind the veil of things visible, has called into existence from the unseen, this stupendous panorama of ceaseless movement and progressive life ?

But the physical laws already noticed are not

the only principles which have worked out the guidance of the unconscious movements of growth by selection and rejection. *Æsthetic*, social, mental, and, in the higher levels of evolution, even moral and spiritual principles, are clearly discernible as producing their own respective and definite effect upon bodily development.

No doubt in prehistoric times, before any embodiments of the higher laws appeared upon the scene, physical laws were almost paramount in their formative influence. Opportunities for rapid locomotion would be then almost non-existent on account of dense vegetation and forests. The same causes would also forbid gregarious habits and the use of social principles in joint attack and defence. Under such circumstances, large and powerful animals would hold an unassailable position, for their existence would not be threatened by many species of an equal size, nor by the ready combination of smaller ones. Again, the dense jungle would lessen competition in pairing, and consequently *æsthetic* principles would not be effective through the agency of females.

GUIDANCE BY ÆSTHETIC LAWS. 57

In other words, during those remote eras,

*PHYSICAL LAWS MUST HAVE BEEN ALMOST
OMNIPOTENT*

in guiding the movements of growth.

The natural result of this reign of purely physical laws appears to have been, the production of animals of huge size and strength, devoid of beauty and often of symmetry.

But under later conditions, principles of a higher kind became effective in guiding the movements of growth. These have tended to modify the influence of purely physical principles to an almost incredible extent. As we shall see, social, æsthetic, mental, and other principles have all impressed their own indelible mark upon the course of bodily development.

*ÆSTHETIC LAWS GUIDING THE UNCONSCIOUS
MOVEMENTS OF GROWTH.*

It is truly wonderful that such *immaterial* factors as laws of the beautiful in sight and sound should have produced so great a *material* effect upon the form and structure of living

beings. The potency of æsthetic law extends far beyond the species in which the sexual choice has occurred. The fact of having to meet foes in whom traits of beauty have been accentuated, rather than elements of brute strength, must have had the greatest formative effect upon all interacting species.

Then æsthetic laws have guided organic development in the following way :—

First, by the embodying of these principles in the females, thus causing their various predilections, as pointed out by Darwin.

Secondly, by the exercise of this choice on the part of females. By these steps, females have caused certain embodiments of beauty to be reproduced, and the less adorned growths to be rejected.

In other words, this strange fact presents itself, —that the *bodily* development of numerous species of living beings has been carefully guided by certain æsthetic principles acting through the mediumship of the females. Moreover, there is the peculiar effect already noticed, namely, that in such cases of sexual selection, the tend-

GUIDANCE BY ÆSTHETIC LAWS. 59

ency of the physical laws to put a premium upon strength is modified and restrained, in favour of individuals which conform to the higher principles of the beautiful. And so in these mysterious processes of selective interaction, we watch as it were the very strokes of the adorning brush and chisel, by which that most Consummate Artist, The Divine Creator, has blessed His living Shrine with touches of His glory.

Here then is a contrast:—

Natural selection is the effect of embodied *physical* laws, giving victory according to physical attainments.

Sexual selection is the effect of embodied *æsthetic* laws, and perpetuates movements of development according to various laws of the beautiful.

The action of physical laws has been to arrest all movements not resulting in organisms of a certain standard of strength, regardless of beauty, and to preserve the strong ones, however hideous.

But the laws of the beautiful have persistently

tended in an opposite direction, counteracting the reign of brute force, putting a real premium upon song, colour, and symmetry ; and literally placing evolution bodily under the guidance of higher principles.

From this group of phenomena we can choose many interesting examples of the way in which the laws, once potential only, have gradually become effective in moulding the development first of one species, and then through this medium, of many others. Take for instance the evolution of that sweetest British songster, the nightingale.

The male bird, before he could have been selected, must have embodied certain laws of sound more perfectly than his less-favoured rival. There must have been a twofold embodiment of these laws. For the principles of music must have become incorporated in the aural and cerebral organization of the female. But when once this had become accomplished even in a rudimentary degree, the entire future development of the species began to pass under the direction of the laws of harmonious sound.

On the other hand, many other species in which

GUIDANCE BY ÆSTHETIC LAWS. 61

the laws of sound never became embodied, except just sufficiently for uttering and understanding call-notes, have remained entirely unconditioned by them.

Thus, through the curious machinery of sexual selection, many æsthetic principles which seem far too vague and transcendent to produce any material effect on evolution, have become embodied in both sexes, and have reacted and collaborated in such a wonderful manner, that quite low down in the scale of life there exists a beauty of form, colour and tone, which often surpasses anything to be found in higher levels.

The laws of the beautiful have proved extremely powerful in their formative effect upon birds and winged insects. The reason for this is, that since powers of flight give a greater immunity from bodily contests than that which is the lot of quadrupeds, the elimination which has taken place has been more frequently the work of sexual than natural selection. In other words, æsthetic laws have been given here a very great influence over physical ones.

In contrasting the action of physical and

æsthetic principles as they may be seen working out their appointed ends in evolution, the following remarkable features of similarity and difference are apparent. Namely, in both cases, the utter extinction of the forbidden movement ; a result effected in the one case by killing, in the other by preventing reproduction.

*SOCIAL LAWS GUIDING THE UNCONSCIOUS
MOVEMENTS OF GROWTH.*

If the way in which æsthetic principles have shaped the course of bodily development is wonderful, no less extraordinary has been the formative power of social laws.

Had these mysterious abstract principles been ineffective, there can be no doubt that the size and shape of most living creatures would have been very different. As we have already seen, the removal of facilities for concerted action in self-defence or attack, inevitably tends to the production of animals of huge size and strength ; selected for the sake of their own individual capacity of killing or resisting attack.

On the other hand, principles of co-operation

give even to small creatures which embody them, a considerable advantage in the struggle for life over those which do not combine. The actual effect of social principles upon bodily growth is to increase perceptive and instinctive powers, often at the expense of size and strength: witness the organization of the ant or bee, or indeed of any species embodying social principles with comparative fulness.

In the case of man the embodiment of social principles has exerted the most profound formative influence upon the movements of growth. As warfare continually reminds us, the laws which underlie the interaction of human beings are still ultimately those of physical force. An appeal to them throws the whole issue back upon fundamental principles, and although this procedure may delay the course of progress; yet in the end, the inherent tendency of the higher ruling laws will again become effective. In his primitive condition man recognized no laws other than those of brute force. Before this tribunal all his disputes were decided, even those of the pettiest nature. The result of this reign of

physical laws, tempered only by the influence of a few rudimentary social and mental principles, was necessarily the growth of an organization grossly animal in character. But when once through the agency of family and tribal life, the primitive savage became aware of a few possibilities of social and civil laws, the terrible premium placed upon ferocity and sinew began to diminish ; until with the advent of a born lawgiver, the whole community passed, by the agency of this one embodiment, under the effective guidance of the more complex civil and moral laws.

New laws now influence their evolution in the most subtle and thorough manner. On the one hand, guiding conscious movements by rules of conduct ; on the other, directing the unconscious movements of growth by putting physical strength at a discount, and by placing a higher value upon mental and moral capacities ; thus laying the foundation for a more refined and spiritual organization.

But to pass one step further into the mysterious guardianship of these higher laws.

GUIDANCE BY SPIRITUAL LAWS. 65

Could we imagine that any change of conditions could affect the movements of bodily development more deeply than when a community passes under the spiritual law of Christian love ?

SPIRITUAL LAWS GUIDING THE UNCONSCIOUS MOVEMENTS OF GROWTH.

It must obviously make all the difference in the world to the trend of bodily development, whether sickly children are allowed to die off, or whether they are enabled to live and have offspring. The question has often been asked, whether Christianity, by partially suspending the operation of natural selection, will not seriously lower the standard of human health and strength. There can be no doubt that its effect is to prevent the one kind of natural selection already referred to ; that is to say, to suspend the action of physical laws which in the past have staved off degeneration. But the question is, does not true Christianity supply a far more powerful and workable antidote to degeneration than physical law ?

If we wish to avoid fatal errors and to gain a true idea of the destined effect of Christian laws

upon bodily development, we must carefully consider *all* their tendencies, in *all* directions. It is a matter of ascertainable fact, that Christianity does truly bring into effective action principles of the utmost importance to human welfare and development.

The materialist may demur at a decline of bodily strength which he attributes solely to a use of Christian principles. But does he realize that the social organism could never have grown into its present mature form without the aid of this element? Does he perceive that the reign of physical law, partial or complete, means a co-extensive reign of animalism? Does he estimate at their full value, the learning, invention, the humane gifts, the countless beneficent organizations, the masses of philanthropic services, which have been the fruits of the religion which bids men to reverence and spare the weak? And yet further, does he recognize, that so far from conducing to degeneration, nothing would produce such a rapid and thorough restoration of national physique, as a real and universal embodiment of Christian principles? They are principles which

GUIDANCE BY SPIRITUAL LAWS. 67

force men to give up self-indulgent practices, and to adopt the strictest moderation in food and drink, which compel their adherents to regard their bodies as sacred, as trusts to be preserved with the wisest solicitude for the very highest of all possible purposes. Whilst Christianity welcomes all kinds of innocent relaxation and bodily exercise as definitely good, it lays down nothing less than iron precepts of self-restraint and abstinence from marriage, wherever spread of disease and injury to humanity may be the alternative.

Without doubt, Christianity is guiding the movements of growth towards the intellectual and spiritual, but this should involve no deterioration of the physical. On the contrary, "Mens sana in corpore sano" is a pre-eminently Christian aim; whilst the most potent factor of the ill-fed and ill-formed thousands of our cities, is the continual infringement of Christian principles by both rich and poor.

So far then from needing less of these principles to stem the tide of physical degeneration, we stand in lamentable need of more of them. No strained system of mental training can compensate

for a lack of that hardness and self-control which are essential gifts of this gracious influence. No other power can guide towards the establishment of a sound, well-balanced stock, and banish the dread visions of a gritless, bloodless race.

*MENTAL LAWS GUIDING THE UNCONSCIOUS
MOVEMENTS OF GROWTH.*

On passing to the effect of mental principles, it is evident that they too have exerted an enormous formative power upon the course of organic development, modifying both for the lower animals and mankind, the effect of purely physical principles. Their influence upon man may be readily perceived. In how many millions of cases must mental principles have been chiefly answerable for the prosperity and preservation of those individuals who were best able to draw upon the resources of mind both in peace and warfare ! In this way the laws of reason and thought have been exercising their unseen guidance upon the evolution of the human body for untold centuries.

*QUASI-MENTAL PROCESS IN THE ANIMAL
WORLD.*

But the way in which mental laws have affected the bodily development of the lower animals is not so easily outlined. The reason for this difficulty is the fact that so many animal actions and habits possess all the outward appearance of resulting from intelligent mental process ; whereas they are often the outcome of unintelligent instinct. On the other hand, there are numerous cases where the complicated and immediate alteration of an animal's ordinary actions to meet some unusual occurrence renders it quite impossible to exclude the factors of mind and reasoning. But the obscurity of these phenomena must not hide from our view the vast effect produced upon animal development by conformity to mental law. Whether that conformity be caused by genuine reasoning, or by some complex playing off of intricate possibilities of animal interaction resulting in quasi-mental actions ; those actions do somehow conform to rational principles, and as such their

formative effect upon bodily development must not be lost sight of.

But quasi-mental actions and adaptations in nature should in no way obscure the true aspect of evolution. They are obviously unavoidable by-products of that vast complexity of co-operating laws which gives rise to innumerable possible side-issues in the course of animal interaction. The instinctive and the intelligent in the lower creation are so closely associated, that even if there were need to attempt distinction, the task would not be advisable.

The slightest use of intelligence in warfare, however instinctive, is sure to earn its reward and to produce its due effect upon the future development of the species.

All animals display a sort of instinctive intelligence in using their natural weapons, as well as their equipment for flight or concealment. These quasi-mental actions, whatever their origin and true nature may be, undoubtedly produce a conformity to rational principles.

A dog when fighting will shake and wrench its head with each grip of its jaws, thereby bringing

GUIDANCE BY MENTAL LAWS. 71

the muscles of the neck and body into play in the best manner conceivable. A cock using its spurs, or a hawk striking its quarry, makes every possible use of weight and wing-power. A rat pressed by foes places its back against a wall, to prevent an attack from the rear. The noiseless stalk of the tiger to the exact distance it can cover with a spring, making use of every possible blade of shelter that circumstance may offer, requires an adjustment of actions, which, although instinctive in origin, yet seem to possess something very like an additional savour of intelligence. The artful way in which many birds draw away their enemies from their young by pretending to be wounded, looks as if the hereditary instinct included a certain faculty of intelligence.

Again, there is an element resembling intelligence in the use which living things make of protective resemblances. In many cases, protective markings would be useless if no proper discriminative use were made of them.

The same may be said of the various attractions of colour and song which are factors in sexual

selection. Unless, for instance, peacocks displayed their tails with "a conscious pride," there could never have been, from a sexual point of view, any value in the adornment.

And yet again, the insect world is full of instances of complex actions. In the life-histories of every species of ant, bee, moth, or beetle, examples might be multiplied almost indefinitely. From these few instances it is evident that the quasi-mental factor has had no slight effect upon the preservation of animals, and hence also upon bodily development.

Now these activities may be due to congenital instincts originated sometimes by what is called "chance," or they may not. This is a matter of absolute indifference to our point. For the fact which concerns us is, that in performing these quasi-mental actions, principles are utilized in exactly the same way as would result from mental process. Whether figures are manipulated by a living person or by a calculating machine, so long as the movements take place in accordance with true mathematical laws, the result is attained by the use of laws which are strictly

GUIDANCE BY MENTAL LAWS. 73

mental. In the same way, when certain motions are set up in the brain causing the despatch of complex impulses to motor-muscles, resulting, let us say, in the complicated series of movements which a swallow goes through in building its nest:—it makes no difference whether the actions are partly tinged with conscious intelligence, or whether they are wholly mechanical. The fact remains, that the order of these brain motions has corresponded not only to the requirements of physical laws ; but to the complicated necessities of adaptation and adjustment. That is to say, the brain motions have taken place according to mental laws. Nor could the possibilities ordained by these laws have existed, without also the possibility of such incidental conformity to their principles as we find in some curious adaptations of living things.

We can therefore entirely dispense with the obscure question as to whether certain animal actions are intelligent or not. For what we know for certain about them is, that very many—whether mechanically like a calculating machine, or not—do still accurately conform to

mental principles, and are only successful because they do so.

For this reason it is true, that laws which can only be called mental, have exerted a far greater formative power upon the main movement of bodily development than is at first sight apparent. Further, as has been already remarked, it would seem that the endless complexity of mental and physical principles, rich with their luxuriant dowry of possibilities for human use, could not exist without creating the opportunity for, and aiding the actual achievement of, the curious phenomena of quasi-mental movements.

A RETROSPECTIVE GLANCE.

Although the machinery we have examined will become still more clearly intelligible when the remaining portions have come before our notice ; we are already in a position to perceive that natural selection is simply a name for the effect produced by the interaction of living embodiments of law. In other words, it is a name for the *effect* produced upon evolution *by various laws acting through the agency of animals*

GUIDANCE BY MENTAL LAWS. 75

upon each other. Sexual selection also is merely a name for a formative *effect* produced by *æsthetic principles* also acting through the *agency* of living creatures.

If these laws had exercised their formative effect *directly*, that is to say, by weeding out the weak, and preserving the selected, by some inorganic means, such as heat or cold, we should doubtless at once be struck by the purposeful aspect of their action, and look upon them as the fingers of a Divine Lawgiver executing designs according to His will. But because these laws always act *indirectly*, that is to say, by means of organisms which embody their principles, we are in danger of being confused by the complexity of the interacting wheels of the machinery ; and with loss both of heart and head, proclaiming the whole process aimless or else unintelligible.

Moreover, as we have seen, the action of the guiding laws is temporarily obscured, but finally rendered more fully intelligible, by the fact that a *combination* of principles is focussed in the selective process in working out the death of

this creature and the preservation of that. For the power to perform the physical act of killing, by no means depends simply upon the embodiment of physical principles ; but upon such factors as the social tendencies of the gregarious species, or the mental or quasi-mental embodiment of the instinctively intelligent. Is it not true, that inasmuch as we have seen the working by which *free interaction* among animals, of necessity leads to the birth of progressive types; the system so far, looks much more like Divine Selection than blind chance ?

Then the point established up to the present, is, that the unconscious movements of growth which have been directed by the *more unrestricted* interaction, and which have led up to the evolution of the human body, can be shown to have been no matters of chance ; but the results of a marvellous system of guiding laws, which have effected their visible work from within the veil of things invisible. For "He leaveth countless tracks behind Him," yet keepeth ever out of sight.

CHAPTER IV.

LAWS AND THE APPARENT ABSENCE OF LAWS.

Contents.

	PAGE
The existence of low organisms a reasonable but not a real objection	79
How the existence of low organisms is rendered possible .	80
Law and the problem of parasites	83
Lawful human action viewed as an indirect effect of the ruling laws	85
Law and the survival of injurious micro-organisms . .	87
Degeneration, its causes and significance	91

“What hope I but Thy mercy and Thy love?
Who but myself shall cloud my soul with fear?
Whose hand protect me from myself but Thine?
OLIVER WENDELL HOLMES.

CHAPTER IV.

LAWS AND APPARENT ABSENCE OF LAWS.

A DIFFICULTY in understanding evolution has often arisen from the fact that its results appear to tend in two opposite directions. On one side, developments towards higher types are in evidence; on the other, there are numerous growths which are either stationary or actually retrogressive.

The former suggest the presence of design, the latter constitute a feature which has been pointed to again and again as a sign of aimlessness. A true explanation of evolution will account, not for one of these effects, but for both.

A REASONABLE OBJECTION.

One can well imagine that the view of evolution unfolded in these pages would meet with the ready objection to which we have already alluded,—namely, how can laws be said to tend to any definite form of being,—let alone an advanced type,—when they permit parasites and low organisms to live and thrive in abundance? Of these there is an enormous group embracing all rudimentary beings, as well as external and internal parasites, and parasitic micro-organisms. These creatures have lived for ages, and how is their continued survival to be explained, if the existing laws make for higher development?

The answer to this question has been already touched upon, and is as follows :—

*HOW THE EXISTENCE OF LOW ORGANISMS
IS POSSIBLE.*

We have recently been occupied in noticing the way in which social, mental, moral, and other laws have actually guided the bodily

THE APPARENT ABSENCE OF LAW. 81

development of man and other animals, and we have seen that these laws only come into effective action through the agency of animals which embody them.

Now, it is very certain that these higher principles have never had any effect upon the evolution of low organisms, because these creatures have escaped open competition with higher embodiments. In other words, the existence of such beings is not endorsed at all by many laws which have actually proved themselves to be principles of bodily development.

The truth of the whole matter is, that low organisms do embody some of those rudimentary physical principles which underlie the possibilities of nutrition and reproduction ; therefore their bare existence is an accomplished fact.

But here their relationship to law ceases. For by avoiding competition with all higher animals, they have escaped the action of laws which would have been the means of bringing them to a higher level of evolution, or else would have wiped them out of the book of nature altogether. Competition they may have encountered, but

only of a very limited character, and entirely restricted to undeveloped competitors.

There can be no shadow of doubt of these facts, for the life-history of each of these rudimentary beings reveals some special isolating causes by means of which *open* competition has been avoided ; whilst the structural deficiencies of their bodies, whether it be blindness, shapelessness, or lack of motive power, show what particular laws have been eluded.

It makes no difference whether the low organism gains its immunity from competition by living beneath the earth like a worm, or whether it is hidden in fur, or attached to skin like a tick, or whether it bears a close resemblance to a stick or a leaf like some larvæ, or whether it remains in shelter except at night, or whether it trusts to rapid locomotion like a day-moth ; in every case its habits will provide the true reason and excuse for its existence amid laws which make for higher development. The manner in which many laws of the first importance to the development of higher animals have been played off against each other in the protective embodiments

THE APPARENT ABSENCE OF LAW. 83

of low organisms, is very curious, but in no way difficult to understand. The vast effect of the laws of colour and light upon progressive bodily development is obvious. Yet it is quite certain that these laws could not exist without giving rise to the opportunity of protective resemblances.

It is very evident, therefore, that the existence of low organisms cannot afford the slightest reason for doubting the purposeful tendency of the laws in question.

THE PROBLEM OF PARASITES.

As we have remarked in the life-history of parasites, there is in every case a set of recognizable causes which have kept the creature out of the reach of laws which would have soon resulted either in its extinction or further development.

But perhaps an opponent would ask,—how can the laws of evolution be called progressive, when they even permit the slightest possibility of the parasitic existence? This objection implies that the laws of evolution cannot tend towards progress, so long as they allow of the possibility of

organisms living in inaccessible places, or attaining only to a minute size.

But here again, the entire universe and all the properties of matter would probably have to be changed if such an alteration could be brought about ; and even if this were possible, its accomplishment would forbid the bodily life of man as well as that of parasites.

Again, the facts of nature show clearly enough, that the prevailing laws are more favourable to the existence of man than of parasites. At a glance we notice that the survival of man is founded upon an entirely different footing from that of parasites.

The complete way in which he responds to social and mental laws, as well as to those which are physical, ensures his existence against any but the most radical changes. His complete assimilation of countless abstract principles enables him to provide for all his needs artificially. His knowledge of physical laws enriches him with a liberal supply of warmth and food. As a race he has no invincible enemy. He is no longer in danger of being greatly reduced in

THE APPARENT ABSENCE OF LAW. 85
number by members of his own species, for his life rests upon a solid foundation of social, moral, and spiritual laws. As long as this world remains in something like its present condition, a continuation of human existence is a practical certainty. In fact, man's survival rests upon a vastly broader basis than that of any other animal, because he is a far more perfect embodiment of a far greater number of the ruling laws.

The case of the parasite is the direct reverse. It embodies none of the higher laws, nor has it ever been subject to anything like an open competition. The laws which have been avoided by a life of parasitic inactivity may cross its existence at any time and cause its final elimination. In short, the parasitic foothold upon survival is most insecure. This will become clearer when the following facts are remembered.

*LAWFUL HUMAN ACTION VIEWED AS AN
EFFECT OF THE RULING LAWS.*

When examining the results of animal interaction in the struggle for life, we saw that

stronger animals gain the power of eliminating weaker ones by virtue of certain laws which they embody more fully than their rivals. In a word, they act as agents bringing certain principles to bear upon their opponents.

Now, man is the most complete embodiment of existing laws. He also is able to act as an instrument of their power, and when his conscious actions are performed in perfect accordance with true physical, social, mental, moral, and other principles, they represent movements which *are actually the outcome and the manifestation of those laws.*

Then the doings of man which are guided by true evolutionary principles, represent the work of the evolutionary laws, and clearly reveal their tendency.

Now if this is the case, what can we learn from human actions about the survival of parasites and injurious micro-organisms? Are the laws which react upon these organisms through human agency favourable to their prosperity?

The answer given by facts is undeniable.

Among the lower animals, for reasons already

THE APPARENT ABSENCE OF LAW. 87

stated, parasites must necessarily have the opportunity of existence. But as soon as we are confronted by the more final results of evolution, namely civilized human communities, parasites are as a rule more often conspicuous by their absence, having been almost entirely eliminated by laws of sanitation and hygiene. In other words, man, the most perfect embodiment of the prevailing laws, is the deadly enemy of parasites. These facts show that the laws governing bodily existence, which are so obviously favourable to man, actually forbid the presence of parasites among their most final products.

Let us now briefly glance at the facts underlying the survival of injurious micro-organisms.

THE SURVIVAL OF INJURIOUS MICRO-ORGANISMS.

The main points of this subject are very clear. These beings flourish best where nature's liberal gifts of air, water, and sunlight are refused ; and where the general conditions of life are contrary to the known principles of health.

Their deadly foe is man, and by the agency of existing laws, their extinction is proceeding *pari passu* with his higher development. Although, owing to a tremendous advantage in invisibility, their existence remained practically unnoticed until a few years ago ; medical science already threatens to destroy many species altogether. Various kinds of bacilli, such as those of the black plague, leprosy, and Asiatic cholera, have been practically banished from the West ; whilst the number of other species, such as smallpox and scarlet fever, has been greatly reduced. Then, without risk of speculation, we may conclude that with the advance of knowledge, and a more thorough assimilation of natural laws, a large number of injurious germs will be rendered harmless if not eliminated altogether.

In unearthing the causes which most frequently lead to the extinction of injurious forms of life, we cannot fail to be struck with the part played by human agency. Indeed, the general aspect of the organic universe looks very much as if the survival of every living creature, will one day depend upon the goodwill of man.

THE APPARENT ABSENCE OF LAW. 89

THE AGENCY OF MAN.

Now there is no secret revealed in the book of nature more pregnant with meaning than this fact. It means that the whole organic world is being affected by the laws embodied in man,—in other words, that the main tendency of the ruling laws is literally centred upon human welfare. The terror of anthropocentric views loses all its potency before the sterling truths of nature. For if they force man to recognise his lowly origin, they also tell him in the plainest language possible, that his supremacy is no matter of blind chance, but the aim of a system of surpassing complexity.

When dealing with the world of lower animals, we remarked upon the way in which it is broken up into numerous groups of competition. In man, however, we have an animal who has broken through all barriers to interaction, and has thrown open nearly the whole organic world as a kingdom for his own government. In other words, the laws embodied in the human will and capacities have already become irresistible conditions of survival for a vast number of living

species,—a number which includes all those creatures which are allowed to survive because they are either useful, beautiful, or harmless.

The control of the lower creation did not come to man until he himself had reached a considerable level of development. The laws of co-operation, and various physical principles had to be embodied by man, before he was able to rid his homestead of beasts of prey. Wherever injurious animals come into contact with him, we shall be safe in saying that their survival depends entirely upon the mental, social, and moral development of their human environment.

A curious instance of this is afforded by the abundance of poisonous snakes in India. Since the natives are unprotected by clothing, deaths from bites are naturally, by no means uncommon. Now at the present day, this mortality from snake-bites is largely due, not to the apathy and ignorance of the inhabitants, but actually to their lack of moral development.

Some years ago the English Government undertook to pay the equivalent of 3d. for every dead cobra produced by the natives. The result was,

THE APPARENT ABSENCE OF LAW. 91

that in order to get the money, they took to carefully preserving the eggs and breeding cobras far and near. All payments were consequently discontinued, and all chance of co-operating with the natives was at an end.

Here we have a curious example of the way in which a whole chain of causes, capable of eliminating an injurious species from a vast tract of land, fell to pieces, owing to the absence of honesty : a factor of quite an intangible nature.

In a similar way, one hears the existence of injurious organisms spoken of, as though they were specially favoured by the ruling laws, and their welfare permanently endorsed by the same authority. Whereas as a matter of fact, their extinction has always been decreed by the laws embodied in man, and this result has only been delayed by the slowness of human development, and the vastness of the evolutionary process.

DEGENERATION.

Degeneration is another phenomenon which may be thought to indicate an absence of laws tending to progress.

It is well known that wherever an organ or limb has fallen into disuse, sooner or later it either dwindles down to a degenerate form, or else disappears altogether. Thus fishes and animals living in darkness become totally blind. The eyes of the mole are reduced to mere specks. The apteryx has only tiny wings in the place of limbs once strong and useful. In the whale the hind limbs are mere vestiges, whilst in the python they consist of little horny terminations.

Now the question is, what is the cause of this degeneration? The Lamarckian theory maintains, that it is due to the disuse of the parts in question, their consequent weakening, and the continued transmission by heredity of the degenerate structures. The Neo-Darwinians, on the other hand, following in Weismann's steps, deny that acquired weaknesses are transmitted, and account for these phenomena on the grounds that the real sources of degeneration are variations in the germinal movements; giving rise to defective growths which have not been eliminated by natural selection, (that is to say, by the action of embodied laws). The view which we have

THE APPARENT ABSENCE OF LAW. 93

taken of evolution sides with neither theory, but casts light upon the possibilities of both.

It is obvious that the withholding of natural selection could not *cause* degeneration *in its origin*, that is to say, in the first individual. But it is equally certain that the cessation of the selective process does in a secondary sense cause degeneration in subsequent cases, by allowing weak structures to be reproduced. For as we have seen, the absence of competition always involves the ineffectiveness of some of the laws which preside over the movements of growth. Hence it is clear, that whatever may originate the first movements of degeneracy, whether it be disuse, congenital variation, or some other cause or causes; the step by which degeneration becomes a permanent feature in the species, is *the passing away of the individuals from the effective influence of those laws by whose aid the perfect structure was originally developed.*

There are abundant proofs of this to be found in all levels of life. Many parasites and low organisms which at the present time have scarcely any powers of motion or perception,

were once active and possessed of well-developed sense-organs. But they took to habits and a mode of existence which enabled them to obtain food without response to the laws of light, sound, or locomotion. Since these laws were no longer used by the animals themselves, nor were effective upon them through the agency of other animals embodying them, they ceased altogether to exert any influence on their development.

As a consequence we find that the organs which once embodied these laws more or less fully have become weak and degenerate. In some cases they are present in the young, but disappear towards maturity, plainly telling the tale of their past history. The extreme rapidity with which degeneration sets in, wherever the effective action of the guiding laws is held up by isolation or by other causes, reveals two most significant facts :—

First, it demonstrates the persistent guidance which these laws must have afforded to living movements in order to have kept off continual degeneration.

Secondly, it shows what an abject lack of con-

THE APPARENT ABSENCE OF LAW. 95

tinuous progressive power there is in the movements of growth when they are unaided by laws directing them through animal interaction. For whereas living matter is powerless to effect continuous progress, and its movements are varied and indefinite ; the laws of inorganic matter under which it exists are invariable and definite.

In other words, the properties of inorganic matter with their invariable sequence of cause and effect, and the unstable properties of matter in its organic condition, cannot produce their full evolutionary result where the interaction of the organic units is incomplete and restricted. In the same way, chemical components need complete interaction to exert their properties fully upon one another. In their case the laws of inorganic action are more easily traced out, and we know that the effect is orderly. So in organic evolution, we may rest assured that aimless chance is non-existent. Up to present stages, the interaction of the living units has been slow and restricted ; in humanity under civilized conditions it moves apace.

Part II.

THE FOUNDATION-WORK OF THE SOCIAL BODY.

CHAPTER V.

SOCIAL, MENTAL, AND OTHER LAWS, GUIDING CON-
SCIOUS MOVEMENTS TOWARDS THE EMBODYING
OF SOCIAL PRINCIPLES.

Contents.

	PAGE
The same reign of law and absence of chance in the realm of conscious action	100
The effect of mental laws upon the growth of the social organism	101
The effect of social, moral, and spiritual laws	104
Some possible objections	110
The result of isolation from the guiding laws	112

“Thus the life of the family, the life of the nation bear us far beyond the visible from which they start. Through those larger forms of life we enter on the unseen.”—
BISHOP WESTCOTT.

CHAPTER V.

SOCIAL, MENTAL, AND OTHER LAWS, GUIDING CONSCIOUS MOVEMENTS TOWARDS THE EMBODYING OF SOCIAL PRINCIPLES.

IN tracing out the formative effect of various laws upon the unconscious movements of growth, we have also been following up the evolution of the human brain. Directly we meet with the higher development of this organ, we are carried across the obscure boundary-line which separates the realm of unconscious movements from those which are conscious.

Then leaving the movements which have organized bodily growth, we turn to those fully conscious actions which have resulted in the production of civilized society.

Here also, as in the case of bodily growth, progress has not taken place by chance, but it is evident that every step in the upward journey has been forced forward by the potency of recognizable laws ; through the action and reaction of living beings one on another.

It makes no difference to which quarter of social development we turn, progress is seen to be due only to the assimilation of various mental, social, moral, and spiritual principles ; first by one or a few individuals, then through their agency by a larger number, and so on, until the laws in question become more or less thoroughly embodied in the whole organism.

It would be beside our mark to discuss the conditions of individual life-histories, showing that beneath the endless variety of occupations, there lies a network of civil and other laws, which are important factors in determining the success or failure of the career, often as regards the individual himself, and always as regards the value of his life to the community.

It would be equally useless to attempt within narrow limits, an exhaustive discussion of human

GUIDANCE BY SOCIAL LAWS. 101

evolution from our present standpoint. However, the following facts will show clearly enough to what a wonderful extent human actions have been guided in their effect upon social evolution by irresistible laws, and what an obvious and divinely beneficent result has been wrested from the ruins of continual human error. Ignorance, avarice, jealousy, stupidity, lust of power and popularity,—these are some of the evils by which the action of the higher laws has been held back as by the very claws of hell.

THE GUIDING POWER OF MENTAL LAWS UPON CONSCIOUS ACTION, LEADING TO THE DEVELOPMENT OF THE SOCIAL ORGANISM.

Perhaps the very idea of conscious movements suggests a certain freedom from the iron grip of the ruling laws. But as a matter of fact, if their guidance of unconscious movements has been close, their direction of conscious actions seems to have been almost more minute. Free-will is a glorious reality, but it can only be exercised upon human evolution within definite limits.

In the realm of conscious action, the battle-

ground of field and forest is forsaken, and the great issues of life are being fought out in the study and in the workshop, in commercial offices and in professional chambers. The contests no longer rest upon physical principles, but upon those which are more complex.

Laws of language and reasoning, laws of various branches of science and mathematics, laws of medicine and pathology, laws of the beautiful in colour, form, and sound, civil laws, principles of diplomacy and political economy, moral laws and spiritual laws, are some of the principles which preside over human interaction to-day, deciding according to the perfection with which they have been embodied, which shall be successful competitors.

Mental assimilation of natural laws has brought to man a vast additional control of physical forces. The same principles which are so useful to the lower animals when incorporated into their *bodies*, giving power to kill and to resist attack, are of far greater value to man, who embodies them in his numerous *manufactures*.

It were needless to point out that reasoning

and mental principles have upheld the lamp by whose guiding light the higher levels of civilization have been reached. The story has been the same from the Stone Age right up to the present day. Whether javelin or bow has played the chief part in battle, or all the paraphernalia of a modern army ; the advantages derived have been to some extent due to certain physical laws which have been embodied through mental process. Thus the steam engine, the loom, the telegraph and telephone, and the endless industrial and other instruments, one and all constitute embodiments of physical laws, and are useful and efficient in proportion to the accuracy with which their principles were embodied, first in the realm of thought, then in the actual structure of the instrument. Fuller embodiment of law may at any time give to an individual or a nation an element of great additional strength. And as we noticed among the lower animals, a new use or embodiment of law comes into existence through the medium of a single individual, but often quickly conditions the entire community.

If it be produced by an *unconscious* movement

of growth, it is called a "*variation*," but an "*invention*" where it occurs as the result of *conscious* process.

THE GUIDING POWER OF SOCIAL LAWS.

The whole of human history is a record of the way in which social, civil, and moral principles have been gradually assimilated, and built into the social fabric of the more progressive nations; in spite of perpetual aberrations and follies, both of rulers and the ruled.

In spite of the opinion of those who imagine that much if not everything in evolution is the result of chance, it appears that nowhere have the main issues of human interaction been free from guidance. For instance, let us glance at the most rudimentary conditions under which human life could be lived, that is to say, in a barbarous community in which neither civil nor moral law is recognized.

Does this mean that the daily crop of disputes and quarrels will be left to the verdict of chance for settlement? By no means. An appeal will be made to the only laws known, namely to

GUIDANCE BY SOCIAL LAWS. 105

the laws of physical force. The question will be settled upon definite principles, the same for both parties. If these principles take no account of moral rights, and are not responsible for moral development ; they are at least profoundly minute in their insistence upon physical excellence.

Gradually, with further mental growth, appeals will be made to arbitrators, that is to say, to principles other than physical ; until the recognition of social principles leads to the establishment of civil laws, and the tribunal of bodily contest is entirely superseded by that of abstract law.

Even this rapid sketch in outline, may suffice to show how a social body becomes more highly organised by the incorporation of social principles, and how the more closely governed interaction of the units renders the whole organism stronger in fibre, better able to encounter resistance ; in short, endowed both with survival and the prospect of further development.

Thus the origin, and also the lasting existence of the social organism, will be seen to depend

upon certain laws which lay down within rigid limits, the lines of sound social growth.

TWO HISTORICAL EXAMPLES.

Without entering into lengthy details, let us note two familiar instances occurring in history, where national instability, and subsequent decay, were brought about by a lack of conformity to those unchangeable moral laws, which can never be neglected for long by any community open to rivalry, except on penalty, not only of internal degeneration, but also of death.

How clearly the records of ancient Greece show that a mere response to mental laws failed to fulfil even the conditions of stability, to say nothing of those of progress!

Notwithstanding the lofty intellectual and æsthetic achievements of the Greeks, every page of their national history reveals the presence of disintegrating influences and seeds of decay. The events which followed the downfall of this race, afford further significant evidence of the truth in question. For their Roman conquerors, although intellectually inferior, proved the stronger

GUIDANCE BY SOCIAL LAWS. 107

of the two, on account of a closer correspondence to important laws of sound national life. But even the Roman constitution, with its methodical social structure, with its elaborate legal and military organization, with its careful regard for order and detail, proved totally unable to stand the wear and tear of time.

But in what direction shall we find the main reason for this decay? The moral and spiritual laws by which alone permanent survival is ensured, had not been complied with. Hence, in spite of the embodiment of so many other features of health and strength, the germs of decay were soon actively at work even in the close-knit fabric of this adamantine organism.

Some theorists of unripe experience, who have never come into very close contact with human nature, either as large employers of labour, or as doctors or clergy, or in any other way, have expressed doubt as to whether spiritual influences are essential to a sound corporate life. None, however, have ever been blind to the paramount importance of moral laws.

The effect of the moral law upon the social

organism may be compared to the part played in animal bodies by the laws of chemical action. Without them, the whole structure would become disintegrated, whilst by their power the interaction of the component units not only proceeds in perfect order, but actually tends, under the further guidance of other laws, to new and progressive developments.

But it is not until we begin to analyse the strength of civilizations which embody Christian principles, that we begin to perceive what those conditions of permanent survival and continual development are, which all extinct and decadent nations have failed to fulfil.

THE GUIDING POWER OF SPIRITUAL LAWS.

It will doubtless be remarked with regard to the foregoing observations, that above all others, the Jewish people were once conspicuous for a tenacious and detailed adherence to the moral laws of Moses ; and yet their national life also met with the fate of decay and disintegration.

The explanation of this fact lays bare a further important truth,—namely, that since moral laws

GUIDANCE BY MORAL LAWS. 109

hold sway over the ethereal realm of conscience, conduct, and duty ; they are of necessity connected intimately with matters of feeling and emotion. In fact, moral laws have their roots in laws which are spiritual. Morality divorced from feeling and religion may still show visible results in conduct, but its roots are cut, its guiding and restraining power is sapped of its virility ; and it is sure to grow weaker, and finally to become impotent before opposing strain.

Owing to an artificial divorce of the spiritual from the moral, the moral vigour of the Jewish nation rapidly disappeared. No increasing spirituality, no receptivity to the higher laws of truth and love marked the maturity of their advancing life. On the contrary, the lack of spirituality grew with passing years, until finally a formal obedience to externals, constituting often a gross violation of the law itself, took the place of what should have been a living force, ruling conduct both private and public, and purging from the corporate life with an irresistible energy such deadly elements as bribery, intrigue, and moral corruption.

Thus, notwithstanding the priceless intellectual possession of a sound moral law, through an incapacity to assimilate its strength, the inevitable process of national decay set in, and increased hand over hand. The end revealed the malignity of the internal disorder, for when the victorious Titus entered Jerusalem, the city was eaten up with factions, strife, and disorder, a veritable hot-bed of misery and social disease.

SOME POSSIBLE OBJECTIONS.

The foregoing conclusions might be opposed by pointing to modern civilizations in a comparatively high state of development, apparently sound and healthy; which possess little spiritual vitality, whilst embracing within their corporate life very much which is both immoral and disorderly.

Whether the violation of law be greater or less than exteriors suggest, the true answer must be,—Wait for results! The evidence of thousands of years as given in history, must not be allowed to outweigh appearances which are the fruits of but a few decades. Nobody can understand

GUIDANCE BY MORAL LAWS. 111

evolution aright who forgets to think in centuries, instead of days, and who does not frequently remind himself that a thousand years are but as yesterday. "The mills of God grind slowly, but they grind exceeding small," and though centuries may elapse before change sets in visibly, continued existence beneath the rule of the laws which prevail, must one day, either in war or peace, apply a test to each nation which will strain every single fibre and tissue to the last ounce.

A FURTHER OBJECTION.

A similar question will no doubt be raised with regard to the lives of individuals.

How, it may be asked, can we believe in the directing power of moral and spiritual laws, or, indeed, believe in any purpose which they may represent ; when open transgression of their principles often meets with no reprisal even in our Christian civilization ?

The reason of this apparent absence of law is not that the moral and other principles already partly embodied in society are a delusion, nor

that their tremendous show of power in holding the fabric together is a deception ; but merely that these laws are not sufficiently embodied in all members of society to render them effective in checking wrong in every quarter. In the same way, the prosperity of some thieves and swindlers does not disprove the existence of *civil* laws which are potentially able to exterminate or punish all wrongdoers ; but it simply means that a certain section of the people among whom the lawless deeds are done, have not embodied the *moral* law thoroughly enough, to render *civil* laws absolutely effective in their immediate neighbourhood.

*ISOLATION FROM THE EFFECT OF MORAL
AND SPIRITUAL LAWS.*

It is a noticeable fact that much moral lawlessness in social life originates from the possession of a sufficient competency to ensure independence of earning a living. Just as some of the lower animals have managed to avoid competition, escaping thereby the action of physical laws ; so there are many human beings, who owing to

GUIDANCE BY MORAL LAWS. 113

wealth, need never measure their capacities with those of their fellows ; but are able to live in ease, untouched by those mental, moral, and social influences which so closely condition the lives of most individuals who labour for their daily bread. In both cases, isolation from an interaction which is closely ruled by laws, produces results which are exactly parallel. The laws which the lower animals escape in this way are chiefly physical, and it is a well-known fact that their bodily development suffers accordingly.

The principles avoided by independent idlers, are mental, moral, and spiritual ; and the result is an arrested growth of the higher powers. Thus the testimony of Nature's facts bears out the Scriptural teaching regarding a mysterious danger attached to riches. Inclination asserts that to be able to retire from work and from close interaction with others, with its frequent difficulties, is an unqualified blessing. A knowledge of evolutionary principles shows, that of all conditions this is most apt to lead to degeneracy of character, and to become an unmitigated curse.

THE MATERIAL IMPORTANCE OF EVOLUTIONAL KNOWLEDGE.

What knowledge can prove more important to those entrusted with matters of national education, or indeed with any subject which bears closely upon the future of our national life, than a clear understanding of the nature, tendency, and power of those laws which in the very being of things, are essential to the permanent welfare and growth of every corporate organism ; whether it be a religious community or a nation ?

Without a shadow of doubt, Christianity contains the power and promise of a perfect corporate life, and in the more final rivalries of nations, the people who have longest and most thoroughly embodied not only its principles, but its spirit, will be the victorious organism.

Could the imagination picture a more ludicrous spectacle than an assembly of educationists seriously discussing the abolition of religious teaching, by way of furthering the welfare of the nation, the corporate organism ; the lawmakers themselves, being in utter ignorance of the nature

of the body they wish to doctor, terribly unconscious that the element adjudged well-nigh superfluous, can be proved, on the unerring testimony of reason, insight, science, and history, to contain the very vital element not only of growth, but of lasting existence? Putting on one side the religious aspect of the matter, the grave fallacy in question seems to arise from the disregard of two facts :—

First, that a sound nation is not only a mere aggregation of individuals of any capacity and any character loosely herded together ; but an organism in which each member is vitally connected with the whole, and specially shaped for his position in its fabric.

Secondly, that one primary object of education should be not merely to render each individual capable of reading and writing and earning a living ; but also of taking his place as a perfectly adapted unit of the whole ; imbued with true principles, possessed of a larger range of ideas, aims, and sympathies, than those which will be called upon in his own individual struggle for life. In a word, education must turn out, not

the individual only, but the unit of the organism ; that is to say, the being capable of a spiritual fellowship, embodying the true laws, formed according to the Perfect Pattern.

Thus the late Bishop Westcott, speaking of the true relationships of man to his fellows, observed :—
“ The fellowship must be social. Every member of it must hold himself pledged to regard his endowments of character, of power, of place, of wealth, as a trust to be administered with resolute and conscious purpose for the good of men : pledged to spread and deepen the sense of one life, one interest, one hope, one end for all, in the household, in the factory, in the warehouse, in the council-room : pledged to strive as he has the opportunity to bring all things that are great and pure and beautiful within the reach of every fellow-worker.”¹

*THE BENEFICENT NATURE OF THE GUIDING
LAWS.*

If there is no more powerful influence for bad than the show of evil in the world, assuredly

¹ *Social Aspects of Christianity*, p. 147.

GUIDANCE BY MORAL LAWS. 117

nothing reveals the ultimate impotence of evil with such clearness as a true knowledge of evolution.

On the one hand this knowledge shows, as we shall see later, that the existence of evil is to be found only in one direction. On the other hand it lays bare a set of laws of such infinite beneficence, that it is obvious that if they were embodied in living beings in only a minute fraction of their completeness, the clouds of evil would dwindle into insignificance before the overwhelming advance of progress.

So wonderful is the beneficence of moral and spiritual laws, and so marked is their progressive tendency, that the veriest Utopia would be born to-morrow if their injunctions were even half obeyed. For instance, let all men respond to the spiritual command of love to the same degree as the twelve Apostles, and we have as the immediate result, the most progressive transformation imaginable.

All prisons are swept out of the land by one stroke, for there is no longer theft or crime. Drunkenness and all kinds of immorality become

unknown. Commercial practices stand upon a perfectly honest basis, for Service and not Success becomes their motto. Instead of profit of the individual, the welfare of humanity becomes the main factor in every undertaking. Selfish extravagance, and the slavish inanities of fashion, are loathed for their inherent vulgarity and meanness. The legitimate ideals of a re-formed society are realized without the evils of ill-considered socialistic theories, without the loss of individual zeal and effort, without the risk of disorder, and the still greater danger of slavery beneath the yoke of a corrupt officialdom. In short, a perfect millennium would follow such a change, as surely as day succeeds the night.

We may call this picture an absurdity, an impossibility, or anything else we like, but we are bound to note that our flight of imagination has demanded no alterations in the laws of human existence, but only in human receptiveness to their requirements.

CHAPTER VI.

A RETROGRESSIVE ELEMENT AMID PROGRESSIVE LAWS.

Contents.

	PAGE
Inherent receptivities in living matter	122
The origin of the sense-organs	123
Mental genius	124
The constant presence of mental and moral impotence in human beings	127
A distinction between progressive and retrogressive movements	130
The element of evil	131
The element of evil in unconscious movements	132
Every living being constitutes a centre of control	133
The nature of evil, and the beneficence of inorganic matter :—The Fall as an explanation	136
The spiritual nature of the Paradise lost	140
The meaning of the allegory	141
Bishop Westcott's views upon the Incarnation and the Fall	145

"I know the right, and I approve it too,
Condemn the wrong, and yet the wrong pursue."

CHAPTER VI.

A RETROGRESSIVE ELEMENT AMID PROGRESSIVE LAWS.

IN alluding to the incapacity of the human will to conform without aberration to the laws which lead to higher levels of civilization, we are touching upon another phase of that most remarkable feature of organic evolution already noticed ; namely, that although the existing laws have consistently exerted a progressive effect upon bodily development, living movements opposed to all advance have been taking place at almost every step of the journey. Among *unconscious* movements they occur frequently as useless "variations" of form and structure, or as the development of parasitic or injurious habits. Even when the formative action of the existing

laws has resulted in the production of sound limbs and progressive instincts, no sooner does interaction cease, and the grip of law relax, than a whole crop of retrogressive results instantly makes its appearance.

If these phenomena are noticeable among the *unconscious* motions of physical growth, they are far more prominent in the realm of *conscious* action. The line of march of human civilization is strewn thickly on all sides with the terrible results of blind errors, and the still more ghastly fruits of wilful opposition to the laws of nature.

The definite nature of the unreceptive and retrogressive element in living matter is rendered all the more conspicuous by the fact that some unconscious movements have started in spontaneous conformity to complex laws which make for progress ; and have continued to embody their principles on further growth.

These contrasting movements may be attributed to "variation" pure and simple, but, as we shall see later on, this view will not stand close investigation. To take a few instances of progressive receptivity. The origin of the eye,

A RETROGRESSIVE ELEMENT. 123

and of all the sense-organs, proves that some living matter has possessed an inherent power of initiating movements in accordance with definite complex principles, such as the laws of light or sound.

The causes to which these first steps of organization were due, have never been explained. To the mind of Darwin they remained enshrouded in mystery, as is evident from his remark, quoted by A. R. Wallace, that the origin of the eye, even to the last, "gave him a cold shiver."

But, as we have just stated, the eye does not stand alone, but the origin of each sense-organ presupposes the existence of definite receptivities in the living matter.

Besides the structure of the sense-organs, the extensive group of phenomena which are referred to sexual selection, must also have been due to an inherent responsiveness to laws of colour, form, and sound, existing in the females.

In the realms of conscious actions, whether scientific, artistic, or relating to social economy, the recognition and application of the simplest principles, involves the presence of inherent

receptivities which are subtle and complicated beyond all powers of expression.

For instance, the accuracy of the linguistic receptivities has been pointed out in the following words :—"It is obviously impossible for us, with our intellectual refinements and blunted senses, to rediscover the ancient harmony which existed between thought and sensation, between nature and man. . . . But among the early races there was a delicate tact, enabling them to seize on those attributes which were capable of supplying them with appellatives, the exquisite subtlety of which we are unable any longer to conceive." ¹

Or again, what shall we say of the spontaneous receptivity to physical, musical, mathematical, and other abstract principles which have arisen in human intellects ; which have given us on paper the laws which keep suns and planets in their places ; which have supplied the world with melodies, and have brought into being every mechanical invention we possess ? And yet again the very word "æsthetics" reminds us of

¹ *Origin of Language*, Farrar, p. 68.

A RETROGRESSIVE ELEMENT. 125

the presence of an inward perceptive faculty, which recognizes the beautiful directly it appears, and which existed itself before that appearance.

But now for the contrast.

Considering the immovable nature of all physical laws, and the fact that every single step in the development of the human brain was wrought out under their rigid and persistent influence through the agency of the sense-organs ; we should expect that it would at least perform its functions in the majority of cases in accordance with true laws, and not give rise to movements stamped with every sign of error and disorder.

But here is the fact as it exists in nature. The untold ages of guidance under those marvelously accurate laws, seem frequently to have counted for nothing, for the completed mental organ is often the slave of every vagary and aberration. In their natural untutored state, the brains of all people work untruly on some subjects, and in many cases on most subjects.

The laws of reason and observation are real enough, but they are not readily assimilated. Even where men of genius have discovered new

truths, the general rank and file have been unable to receive them at second-hand, but have floundered about for years in the mire of stagnation, only advancing along the pathway of progress, as has been said, "by falling into the ditch of error on either side."

The same appalling lack of receptivity to true principles is apparent in the results of social life. One would reasonably expect that in the majority of cases, the ties of friendship and blood, operating in family circles, would have tended to develop love and kindness. But what do we find has been the actual result? Throughout whole races, those close and sacred intimacies have led to nothing better than habits of parricide, cannibalism, and other practices even more revolting.

The late Duke of Argyll referred to these phenomena in the following words:—"In the developments, for example, of social habits, and of the moral sentiments on which these principally depend, no results, however extravagant or revolting, are at all certain of being rejected because of their absurdity. Among men we see it to be a fact that no practice however cruel, no custom

A RETROGRESSIVE ELEMENT. 127

however destructive, is sure on account of its cruelty or of its destructiveness to be at once detected and rejected as self-evidently wrong.”¹

Again, compare the grace of the plant-world, or the spirit of beauty and sweetness often embodied in bird and insect, with the distorted æsthetic ideals of certain native tribes. Darwin mentions an Arabian custom of gashing the cheeks and temples, by way of improving the personal appearance. Some South African tribes remove the eyelashes and eyebrows. Other races knock out the four front teeth ; whilst certain races in North and South America pierce the lips and insert various objects, in some cases a disc of wood four inches in diameter.

Now, however broad a margin may be allowed for difference of opinion with regard to the beautiful, it is clear that in such cases the barrier-line of error has been widely overstepped ; and that there is behind these customs no instinctive apprehension of true principles of beauty, but only tendencies embodying ideals of brutality and grotesque ferocity.

¹ *Unity of Nature*, p. 444.

But besides these various peculiarities so antagonistic to progress, we are also confronted by the utterly powerless condition of the human will. This appalling truth is forced upon us from all sides, that even when human capacities ensure a knowledge of what is right, the will can never be relied upon to put that knowledge into execution.

“For what I would, that I do not ; but what I hate, that I do.” If this was the pitiful complaint of a man as good and strong as St Paul, how helpless and prone to error must the will of man have been in his prehistoric condition !

Or again, Professor Huxley’s words reiterate the same complaint:—“I protest that if some great Power would agree to make me always think what is true and do what is right, on condition of being turned into a sort of clock and wound up every morning, I should instantly close with the offer.”

Then in short, we recognize this strong contrast :—

On the one hand a set of complex laws which govern all the motions of inanimate matter with

A RETROGRESSIVE ELEMENT. 129

invariable results, and which have so co-operated in directing the movements of living matter, that wherever their action has had full play, they have persistently forced forward the processes of growth towards the more perfect organization both of bodily and of social development.

On the other hand, over against this universal reign of law, we find that directly matter passes into a *living condition*, the uniformity of its movements ceases. There appears that strange feature called "variability." Thus the growth of crystals proceeds in every case with absolute precision, conforming to its own structural pattern with an invariable regularity. But the movements of living matter have run in almost every direction, giving rise not only to numerous vagaries of form and structure ; but also to growths accurately conforming to principles which are definitely progressive,—that is, those which form essential parts of the highest evolutionary products.

As an explanation of this variability, we may call to mind the vast structural complexity of organic tissue, and its consequent susceptibility to varied causation. But still there remains the

following distinction between all resulting movements ; a distinction which only becomes more strongly marked the higher we ascend in the scale of development.

AN IMPORTANT DISTINCTION.

All variations in the unconscious movements of growth fall naturally into one of the two following classes.

Either the variation has given rise to an organ or adaptation which has in no way furthered the main forward movement of evolution ; or else it has originated some feature directly or indirectly subserving progress.

In the former case, from an evolutionary standpoint, the new movement was not progressive. In the latter it became a definite factor in the upward development.

The same contrast exists in the realm of conscious movement.

Some actions are carried out in accordance with true principles, mental or moral, and in their wake progress and welfare to the community follow as natural consequences.

A RETROGRESSIVE ELEMENT. 131

On the other hand, lawless and erratic conduct is always in evidence, producing nothing but stagnation and retrogression.

Where the retrogressive movement is unconscious, as in growth, it can only be called a "variation."

Where it is conscious, it is readily described as "evil" and as "sin."

THE ELEMENT OF EVIL.

But where are we to draw the line between conscious and unconscious movements?

Science can admit of no essential distinction between the two. Now this means that an element of evil is essentially bound up with living matter throughout evolution; and moreover, that for conscious and unconscious movements alike, those which are progressive are positively good, whilst those which tend in an opposite direction are essentially evil.¹

¹ Cf. "The most universal term for sin in the Old Testament is *chatath*, derived, like its New Testament equivalent—*ἀμαρτάνω*—from a word signifying—to miss the mark. It implies failure to reach a point aimed at."—*The Ascent through Christ*, Griffith Jones, p. 122.

*THE ELEMENT OF EVIL IN UNCONSCIOUS
MOVEMENTS.*

In the very nature of things, this distinction between good and evil must embrace phenomena of great obscurity ; for it starts in depths where living movements are so vague as to possess no traces of either a progressive or a retrograde tendency. But for all this, the distinction must in all cases be real, and easily discernible to a mind capable of perceiving the relation of each animal to the main forward evolutionary movement. The motion of a watch's hour-hand is not sufficiently marked to be seen without a magnifier, but it is nevertheless a reality. In the same way the observant eyes of the ruling laws take account of every minute modification of growth, and through animal interaction mete out its due reward.

Although it would not be desirable to enter here into a discussion as to the nature of living matter,¹ there are some distinctive features be-

¹ The nature of living matter is dealt with in the Appendix.

A RETROGRESSIVE ELEMENT. 133

longing to it which it may be well to mention, since they cast further light upon the retrogressive element now before us.

A LIVING ORGANISM CONSTITUTES A CENTRE OF MOTION AND A CENTRE OF CONTROL.

If we compare the strictly mechanical nature of the physical forces, with the variable movements of living matter, a curious element of self-controlled individuality becomes apparent. With lifeless matter, effects must follow causes in invariable sequence, according to a necessity imposed from some external centre. Although reason compels us to conclude that there must be somewhere in the universe a final cause of the laws which govern the motions of inorganic matter, that there must be some centre of authority whence issued the first causal stream which has now swollen into the vast flood of cause and effect which we see around us; yet nowhere among the physical forces can we feel ourselves approaching this central source of power.

Every atom of inorganic matter, every single form of physical energy, obeys with unvarying

obedience laws imposed upon it from an unknown centre of control. Scrutinize the inorganic universe in any direction you like, feel it all over, there is no spot upon which you can rest your finger and say,—Here we are near some centre of control, here is the origin of independent movement, here is organization and individuality !

On the contrary, every physical force you encounter, every physical law you work back to, is dependent upon some other cause beyond it, and equally remote from any centre of control.

To use the words of Professor Ward :—"Thus on the physical side we have a single system, unvarying law, quantitative exactness, complete concatenation of events—in a word, one vastly complex, but rigidly adjusted mechanism. But on the psychical side we have as many worlds as there are minds, connected indeed, yet independent to an indefinite extent ; a series of partial and more or less disparate *aperçus* or outlooks ; each for itself a centre of experience, but all without any exact orientation in common."¹

Thus the whole inorganic universe is subject

¹ *Naturalism and Agnosticism*, vol. i. p. 15.

A RETROGRESSIVE ELEMENT. 135

to this Power which reigns from beyond ; not a single movement is variable, in the sense of obeying one principle at one time and another at another.

But in the case of living matter, there is the strongest contrast. Every organism constitutes a centre of control and a centre of motion. Not only is the centre a centre of control over the movements of the organism itself, but every living being constitutes a centre around which various forces of nature are played off one against another, for the benefit of that individual. Thus of all known movements in the universe, the actions of a living being can be, and often are determined, not by physical causes, but by reasons which have reference to the will or caprice of the organism. For instance, if a match be applied to gunpowder, and the physical conditions are favourable, there is no power of control within the compound to prevent an explosion.

But if you place food before a captive bird, although intense hunger and the stimulus of the sight of food may supply the physical conditions for eating ; the centre of will within pre-

vents the result, by counteracting the physical causes.

If the presence of this factor of control is recognizable even in the lower levels of development, it rises into full distinctive prominence in the actions of human beings. As an instance which is but one of a vast group, we may remember that time after time has the spiritual factor of religious influence overpowered all physical causes, and trampling upon even the natural instinct of self-preservation, has welcomed death rather than change of opinion. There is a well-worn, homely saying, to the effect that you may take a horse to the water but you cannot make him drink. The proverb is a true one, but it means nothing less than this,—that the will of a living being constitutes a citadel of self-control, against whose gates no power in the universe, physical or non-physical, can prevail.

*ADDITIONAL FACTS REGARDING THE NATURE
OF EVIL.*

Then if the great floods of living movements which have resulted in organic evolution have

A RETROGRESSIVE ELEMENT. 137

all emanated from individual centres of control, evil will always be found to imply a centre of control generating movements which do not conform to the demands of a prevailing set of laws which make for progress.

All progressive movements, on the other hand, correspond to the word "good."

Since there are no centres of control in lifeless matter, but only movements of one law-abiding character, nothing is found in the inorganic condition of matter definitely of the nature of evil. It may be excusable to make a brief digression here in order to emphasize :—

THE BENEFICENCE OF INORGANIC MATTER.

This fact is important on account of its contradiction to certain errors which have survived for ages.

The theories of the Gnostics, and of many of the ancient philosophers, as well as the beliefs of Buddhists and some Theosophists at the present day, maintain that matter contains the very principle of evil itself; whilst all spirit is essentially good. This fatal error has invariably given

rise to the logical but false corollary, that since all matter is evil, and all spirit is good, the road to goodness lies in the renunciation of every form of material attraction. The most terrible sufferings have been welcomed by ascetics actuated by this belief. Their patient and continuous warfare against the animal appetites, with the exercise of an iron will over the natural affections, represent a series of human efforts full of stern grandeur, but also of pathetic futility.

Now the question arises, as to how the contrasting progressive and retrogressive movements can be explained without begging the aid of unknown causes. To talk of the variability of living matter, is to elude the problem by a meaningless phrase. "Variation" is far from being a satisfactory term, for it thrusts us helplessly back upon unknown causes. Innovations of living movement and growth are undoubtedly facts. It is equally evident that a certain proportion of them are due to insignificant varying causes, giving rise to results which may correctly be called variations. But if we call all innovations "variations," shall we not be borrowing the

A RETROGRESSIVE ELEMENT. 139

logic of the famous jury which found a prisoner guilty of murder ; not because there were any facts proving that he had done wrong, but because he was seen in the company of another man who had certainly committed murder ?

Darwin himself was evidently dissatisfied with the theory, for he writes :—" Our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend to assign any reason why this or that part has varied." ¹

Referring to the same subject, the late Duke of Argyll remarked :—" No one knew better than Mr Darwin that the weakest part of his theory is that which assumes variations to be accidental." ²

THE FALL AS AN EXPLANATION.

I know of no hypothesis nor fact which can cast such a full and satisfactory light upon this problem, as the revelation of the Fall.

Among the first Biblical messages, we are given to understand that the living element in this world is in a defective condition, and

¹ *Origin of Species*, p. 122.

² *The Unity of Nature*, p. 267.

powerless to obey the laws which make for good. The account of the Fall is obviously allegorical, and can only be intended to be a series of figures representing the actual facts. But whatever may be doubtful in the meaning, the conditions of life as portrayed in the narrative were totally different from ours. Pain, death, change were all unknown. Such distinctive statements cannot be without point, nor can their significance be deceptive. The words imply that the bodies of these living beings were not composed of matter in its present condition ; whence the obvious conclusion is, that their existence was a spiritual one, —a progressive existence no doubt, but still spiritual.

*THE SPIRITUAL NATURE OF THE PARADISE
LOST.*

Moreover, St Paul's emphatic teaching as to the spiritual nature of the Paradise regained, and the spiritual body that alone shall inhabit it, constitutes almost a proof of the spiritual nature of the Paradise lost. But if this be true, the process of evolution now going on must be in its

A RETROGRESSIVE ELEMENT. 141

real nature a *re*-creation, not a creative process. Creative of a body of matter it certainly has been,—a body sacred and indispensable it is true, but yet temporary and unimportant, compared with the tenant of its citadel, for whose spiritual re-creation the whole systems of evolution and redemption have been ordained.

The fact that the Fall involved the loss of a comparatively perfect spiritual existence, casts an indispensable light upon several problems of evolution.

The catastrophe delineated in the account, points to a cause of an essentially spiritual nature ; namely, lawlessness in a living will. Whether the allegory is intended to depict the transgression of one or several orders of spiritual beings personified by the figures of Adam and Eve, or whether the terrible change originated only in two beings, must remain uncertain ; unless we understand St Paul's words literally : "*As through one man sin entered into the world, and death through sin ; and so death passed unto all men, for that all sinned.*"¹ The idea of death being

¹ Rom. v. 12.

caused by *one* man is repeated several times by St Paul. But this would be natural in the case of a teacher seeking to impart further instruction by means of ideas already familiar to his audience, and thoroughly grasped by them. There is therefore a possibility of creating errors by misunderstanding St Paul's use of allegory.

The important message of the allegory, however, does not lie in this point, but rather in the fact that their disobedience was the actual cause of the imperfections and misery of all living beings upon this planet. Deeply significant are St Paul's words, "As in Adam *all* die." The act of spiritual lawlessness is described by a few masterly strokes of imagery in the episode of eating the forbidden fruit. With equal power the punishment is described. The deteriorated beings lapse out of harmony with the unchangeable laws and the conditions of perfection. They pass out of the presence of their Divine Creator. Eden, the sphere of spiritual existence, is closed against them. Their nature, once quickened with perfect vitality, becomes deadened, and the deadened but undying energy falls from

A RETROGRESSIVE ELEMENT. 143

the spiritual, into the sphere of material being. This would seem to be the literal interpretation of banishment from the Garden of Eden into an existence conditioned by pain, change, and struggle. But what of the possession of material bodies? From the sweat and travail of ages, these were yet to be evolved.

Thus the allegory leaves the terrible narrative where science picks up the thread. The curses which Scripture describes as descending as the result of sin, and the constant pain which it declares must be the inevitable accompaniment of the fallen existence; plainly suggest the breaking up of the orderly movements of inorganic matter, into that strange disorder, change (metabolism), and corruption, which arise directly matter passes into what we know as a living condition. Cast out of spiritual existence, the unified personal life of spiritual beings became the potential source of life in living matter,—life with all its manifold types and phases of being, struggling in its myriad forms and ruthless individualism towards the far-distant goal of a re-created unity. Thus in Adam all died, but died only to live once

more. And lo, with the very first sign of material life, it is those once broken laws of God which are there, as mothers guiding the first movements of the new-born life ! And who will be prepared to deny the presence there of a Divine Spiritual Co-operation which has never been withdrawn ? And yet further, who will say that the whole physical universe in all its stupendous enormity was not designed and consecrated to be the cradle and sanctuary, first of creation, and when creation failed, of the re-creation of the ruined work ? Is it not true that "The Lamb that hath been slain from the foundation of the world,"¹ did thus lay at the cost of nameless self-surrender, the glorious foundation-work of this Divine operation ; and thus, too, accomplish the primary steps of His still more glorious achievement of a Personal Redemptive Sacrifice, —a Sacrifice rendered necessary solely by the results of lawlessness and sin ? Such a meaning truly seems to underlie several deep passages of Scripture. Such a meaning, too, is in harmony with many of the attributes of the

¹ Rev. xiii. 8.

A RETROGRESSIVE ELEMENT. 145

Divine Creator and the music and splendour of His works.

Let us now turn to Dr Westcott's profound thoughts upon the Incarnation and the Fall, as given in *Christus Consummator*. He writes: "The Incarnation is commonly made to depend upon the Fall. And the whole tenor of revelation, as I conceive, leads us to regard the Incarnation as inherently involved in the Creation. . . . We are taught that man received, received inalienably as man, a fitness for gaining through growth and discipline and continuous benediction, union with God. God's image was given to him that he might gain God's likeness. . . . The Incarnation, in other words, when we use the term in the most general sense, apart from every thought of suffering and humiliation, corresponds with the perfection of man as he was constituted at first, and not merely with the restoration of man who had missed his end. . . . The marvel is that the purpose of creation was wrought out in spite of that wilful self-assertion of the creature which might have seemed to have fatally thwarted it." ¹

¹ *Christus Consummator*, p. 104.

In these words Dr Westcott directs the mind to humanity in its unfallen state, blessed as it was with a spiritual existence similar to God's; but created with the hope and promise of gaining through growth and discipline God's likeness, and becoming partaker of His Being. Belonging to this unfallen state as part of its creative system is the birthright of the Incarnation. Dr Westcott explains that he uses the word "Incarnation" "in the most general sense, apart from every thought of suffering and humiliation." For the coming of Christ to share human life *before* the Fall would not have involved participation in a bodily existence of flesh and blood. "Incarnation" therefore, would not have been the descriptive term for this special Divine Advent to the creature.

But to man, fallen as he is, "Incarnation" is the only word which can convey the idea of this creative—for him *re*-creative—fellowship with the Son of God. A word than which, none other to the end of time will ever have a more powerful, sacred; and unexpressibly tender meaning. For whether under fallen or unfallen conditions, He alone in the nature of things could fulfil the

A RETROGRESSIVE ELEMENT. 147

original plan ; calling into existence for His creatures the non-existent graces ; bringing them in Himself into the Oneness of a perfect life, and thus Himself becoming the Consummation of their Divine potentialities. And when that greatest of all gifts, free will, failed ; He alone could become the Re-creator of the broken design and the desecrated love.

Before passing on, it would be well to notice the alternative interpretation of the allegory, which understands the Fall as having happened *after* material beings had been created. This view is beset with difficulties, and seems to run counter to the most salient points of the narrative. Although the Paradise of Eden could scarcely have been inhabited by beings of flesh and blood, the beings personified under the figures of Adam and Eve may have been "clothed upon" with spiritual bodies, as real as our material ones. Moreover, is there any essential barrier between the two ? The Resurrection has shown that the gulf between the material and spiritual is not one of impassable reality. Philosophy has led to the same conclusion.

Again, it would only create unnecessary obscurity to suppose that the primary conditions of matter before the Fall were so totally different from those existing at present, that whilst admitting of *material* bodily life, neither change nor pain was possible. For would material being under such conditions differ from a spiritual existence, since such an existence in no way precludes the possession of spiritual bodies?

Then since pain, imperfection, and death have been accompaniments arising from the inherent peculiarities of living matter ever since it existed in the early stages of evolution; it follows that the Fall must have preceded these stages, and been productive of all these marks of impotence.

The Revelation of the Fall thus understood will be found to assist in piecing into true unity many fragments of knowledge.

Whatever may be the origin of the allegory of the narrative, although it may be entirely human in design, the fact remains that it has been used as a vehicle for conveying truths of the very first importance to an accurate understanding of life's deepest mysteries.

A RETROGRESSIVE ELEMENT. 149

In their literal sense the stories of the Creation and the Fall have proved wonderfully suitable to the infancy of mankind. In the normal course of development, minds which have outgrown the literal interpretation, naturally acquire the power of penetrating to the further truths beneath the surface.

No man could take exception to the human form of these allegories with better sense than he could resent the childish cast of the moral stories that he listened to at his mother's knee ; stories which have aided him unconsciously throughout his life.



Part III.

THE BIRTH OF THE SPIRITUAL BODY THE CHURCH.

CHAPTER VII.

SPIRITUAL RE-CREATION AND THE ORIGIN OF THE SPIRITUAL BODY THE CHURCH.

Contents.

	PAGE
Passing from the social to the spiritual organism . . .	153
The former schooling of humanity	153
Mental development cannot be the final goal of evolution	154
The reason why	155
The wonderful effects of Christianity	157
The re-creative work	159
Professor Seeley's comparison	160
The phenomenon of conversion : typical examples . . .	161
Professor James' definition	161
Re-creation of the individual is the first step in the re- creation of the social organism	167
Christus Recreator	169
The facts of conversion centre around Jesus Christ . . .	169
His supreme re-creative influence and the cause	171

1. The first part of the document is a list of names and addresses of the members of the committee.

2. The second part is a list of the names and addresses of the members of the committee.

3. The third part is a list of the names and addresses of the members of the committee.

4. The fourth part is a list of the names and addresses of the members of the committee.

5. The fifth part is a list of the names and addresses of the members of the committee.

6. The sixth part is a list of the names and addresses of the members of the committee.

7. The seventh part is a list of the names and addresses of the members of the committee.

8. The eighth part is a list of the names and addresses of the members of the committee.

"The Church which is His Body."—EPH. i. 22.

CHAPTER VII.

SPIRITUAL RE-CREATION AND THE ORIGIN OF THE SPIRITUAL BODY THE CHURCH.

ON passing to the more final phenomena of evolution, the true nature of the process stands out in clearer relief. Familiarity with the conditions of civilized existence may blind the eyes to much that would otherwise prove most eloquent of life's purpose; but the words, education,—discipline,—growth,—are stamped everywhere with a prominence too universal to admit of inadvertence or misconstruction. They ring with tones explaining distinctly those strange formative processes wrought out through the animal interaction of bygone eras. All that machinery is rendered fully intelligible by its product,—the human body;—evolved to be the adequate but complex instrument for the

soul's use. And when once equipped with a body, what a magnificent educational apparatus is at hand in the inorganic and organic worlds. Even inorganic matter has proved a priceless teacher. Hard has been its task, and stubborn its pupil. Yet those rigidly accurate motions and perfectly governed relationships have acted incessantly upon the powers of thought and reason as a corrective of many psychical weaknesses closely allied to evil ; whilst the beauty of inanimate nature has recited its poems in silent words, which in spite of frequent unreceptiveness, have burned deep into the soul of humanity.

*MENTAL DEVELOPMENT IS NOT THE FINAL
GOAL OF EVOLUTION.*

Thus, if we allow the evidence already adduced to suggest that educational and spiritual purposes lie beneath life's mysteries ; the considerations yet to come will prove most strongly corroborative. For what intellect could conceive of a richer combination of influences for the guidance and correction of the mind, and the development of the feelings, than that which is supplied by social

SPIRITUAL RE-FORMATION. 155

and family relationships ? But no careful thinker can suppose that mental growth is the final goal of evolution, for the simple reason that a higher product exists, and the ruling laws demand its existence. As we have seen, intellectual culture, even when carried to its highest pitch of perfection, ensures the welfare neither of the individual nor the community. The needs of man are fuller, the needs of his family and country are fuller.

No race which has advanced to a high condition of civilization has ever lacked moralists, or men of intellect. From the treasures of philosophy, fragments of the moral law have been unearthed and pieced together in every land under the sun. The laws enunciated by Solon, Confucius, Buddha, Mahomet, and others, have spread in varying circles of influence, making, no doubt more or less, for order and progress ; and in some cases, helping to preserve a national vitality. But in no single instance has the introduction of the mental or moral factor, brought a penetrating, re-creative influence to bear upon the individual himself ; nor a power capable of producing a social organism so full of life and high feeling, and so

perfectly adjusted in all its functions, as the still incomplete embodiments known as Christian civilizations.

The reason for this is partly that mental correction cannot reach the deeper diseases of human nature. To attempt to cure a will morally weak, or feelings essentially distorted, by mere intellectual teaching, would be as hopeless as to try to remedy a weak heart by explaining to the patient the organ's action. The need in both cases is one not of outward knowledge, but of inward power and restoration. Influences which appeal only to the intellect, can never produce a great result in the re-creation of the human will and inclination.

This has been abundantly proved by the criminal statistics of France and Australia during the latter half of the last century. In both these countries less religious instruction has been given, and additional attention bestowed upon education ; in hope that mental enlightenment would lead to a diminution in crime.

But what has been the actual result ?

A decided and steady increase.

In the words of one who has made a lifelong

SPIRITUAL RE-FORMATION. 157

study of crime and reforming agencies,—“Education has rather varied than decreased crime.”

Then valuable as the inculcation of mental and moral principles has been in leading up to a certain level of development ; these influences, after centuries of trial, have proved absolutely powerless to endow any people with a lasting national existence ; much more so to restore the long-lost birthright of spiritual soundness.

But if it is beyond dispute that mind is not the last word in evolution, and that the mental factor has not supplied, and cannot supply, all that is needed to complete either the perfect man or the perfect state ; the requisite element is discovered at once in the spiritual energy of Christianity.

THE WONDERFUL EFFECTS OF CHRISTIANITY.

In the birth of Christianity we watch human evolution passing under a totally new influence, the influence of one personality. With regard to the results of Christianity, they represent by far the most remarkable phenomena we meet with in all the chapters of human history. To

enumerate them would be to describe almost every institution of vital importance to society. To quote Mr Kidd's words :—"The evolutionist perceives that it (*i.e.* religion) in reality dwarfs and overshadows everything else. Whatever we may, as individuals, think of the belief in which it originated, or of the principles upon which it was founded and upon which it still exists, we are all alike the product of it ; the entire modern world is but part of the phenomena connected with it. Science must sooner or later recognize that in this movement we have under observation, the seat, the actual vital centre, of that process of organic development which is still unfolding itself in what is called Western Civilization." ¹

THE RE-CREATIVE WORK.

Now although the tremendous results of Christianity and its unique transforming influence upon human civilization cannot be denied, and are commonly recognized as cause and effect, when seen thus in the aggregate ; many thinkers have failed to examine the working of this power

¹ *Social Evolution*, p. 12.

THE FACT OF CONVERSION. 159

upon the lives of individuals, and so have never thoroughly understood its real nature, nor its true effect upon civilization.

Then by focussing our attention upon individual units, we shall learn most about this process of re-creation, of which we can see such evidence in the transformation from heathen to Christian civilizations. Now it is a matter of common knowledge, that the transforming effect of Christianity upon the spiritual powers of man, changing them from bad to good, is one of its most marked characteristics. And history proves that these *personal* conversions or re-creations, whether sudden or gradual, have always been the first steps towards the progressive development of the society. But in dealing with the subject of human conversion, we are watching the spiritual element potentially present in the earlier stages of evolution, but now fully manifested in man, becoming the object of the individual care and influence of the most wondrous Personality the world has ever seen.

Wherever His power has worked out its characteristic effect, the transformation of social

relationships, and the re-creation of the individual character, have been the normal results. So that an outlook upon humanity to-day reveals this re-creative influence lying at the root of all that is most important and essential to civilized life. In other words, the most final stages of evolution represent nothing less than a re-creative process of which the power of Christ is the all-important factor.

But inasmuch as the transformation of the social organism depends upon the spiritual re-creation of its component units, the individual, and the family ; the work must necessarily be one of slow procedure. The first stages of this re-creation are, however, unmistakably evident, and are well delineated in the following comparison from the pen of the late Professor Seeley :—" Compare the ancient with the modern world ; look on this picture and on that. One broad distinction in the characters of men forces itself into prominence. Among all the men of the ancient heathen world there were scarcely one or two to whom we might venture to apply the epithet ' holy.' In other words, there were not more than one

THE FACT OF CONVERSION. 161

or two, if any, who besides being virtuous in their actions were possessed with an unaffected enthusiasm of goodness, and besides abstaining from vice regarded even a vicious thought with horror. Probably no one will deny that in Christian countries this higher-toned goodness, which we call holiness, has existed. Few will maintain that it has been exceedingly rare. Perhaps the truth is, that there has scarcely been a town in any Christian country since the time of Christ where a century has passed without exhibiting a character of such elevation that his mere presence has shamed the bad and made the good better, and has been felt at times like the presence of God Himself.”¹

But to return to the subject of individual conversion. As a fact in the history of human nature it is of course well known to psychologists. For a definition of it from a scientific standpoint, we cannot do better than to borrow Professor James’ words :—“ To be converted, to be regenerated, to receive grace, to experience religion, to gain an assurance, are so many phrases which

¹ *Ecce Homo*, p. 192.

denote the process, gradual or sudden, by which a self hitherto divided, and consciously wrong, inferior and unhappy, becomes unified and consciously right, superior and happy, in consequence of its firmer hold upon religious realities. This at least is what conversion signifies in general terms, whether or not we believe that a direct divine operation is needed to bring such a moral change about.”¹

The careful examination of these spiritual experiences, as given in the Gifford Lectures for 1901, from which the above quotation is taken, are full of interest. The author lays stress upon a fact which from our standpoint has a special significance ; namely, that the surrender of the personal centre or will, is an essential of regeneration. “Starbuck,” says Professor James,² “seems to put his finger on the root of the matter when he says that to exercise the personal will is still to live in the region where the imperfect self is the thing most emphasized. Where, on the contrary, the subconscious forces

¹ *The Varieties of Religious Experience*, p. 189.

² *Ibid.*, p. 209.

THE FACT OF CONVERSION. 163

take the lead, it is more probably the better self *in posse* which directs the operation. Instead of being clumsily and vaguely aimed at from without, it is then itself the organizing centre. What then must the person do? 'He must relax,' says Dr Starbuck,¹ 'that is, he must fall back on the larger Power that makes for righteousness, which has been welling up in his own being, and let it finish in its own way the work it has begun. . . . The act of yielding, in this point of view, is giving one's self over to the new life, making it the centre of a new personality.' "

The following description of conversion given by Dr Mason also emphasizes important features. He writes :—"The essence of conversion is a true movement of the will, turning solidly from self and the world to God. If it is true that all men are born with a bent towards sin, and have their faces set in a wrong direction, then at some point in their lives or another, and in some mode or another, there must come a voluntary change.

¹ Professor James here quotes Dr Starbuck's *Psychology of Religion*, p. 115.

But it is a fatal mistake to suppose that conversion must be exactly alike in all, and to take as the normal type of it that which comes when a man has grown up to years of discretion in carelessness and sin. It wears different aspects in different men, according to their temperament, and according to their circumstances. It may take place in infancy, or it may take place on the death-bed.”¹

As one typical instance of these remarkable re-creative occurrences we might well turn to the life-history of St Paul. What change of disposition could possibly be more radical or more permanent? The contrast drawn by the late Professor Drummond is indeed as deep as the depths of human nature itself. On the one hand, the fierce zealot readily consenting to the stoning of his fellow-man. On the other, the patient, tender spirit which is immortalized in the first Epistle to the Corinthians, in that glorious dissertation upon the love he had learned from his Master. Again, the same individual who in the weakness of the natural man looked out

¹ *The Faith of the Gospel*, p. 361.

THE FACT OF CONVERSION. 165

upon the course of duty with lamentations of impotence ; in his regenerate power exclaims : “ I can do all things through Christ which strengtheneth me.” Again he writes, “ I live, yet not I but Christ liveth in me.” The record which St Paul gives of his own spiritual experiences is very far from standing alone, for the same conversion of the fallen nature has been attested in the careers,—may we not accurately say ?—of millions of earth’s noblest sons and daughters.

By way of a few further brief examples, I will repeat Professor James’ quotations from the numerous cases communicated to Dr Starbuck. The stories of the momentous change are told in words of simplest brevity :¹ “ I had said I would not give up ; but when my will was broken, it was all over,” writes one of Starbuck’s correspondents.—Another says : “ I simply said : ‘ Lord, I have done all I can ; I leave the whole matter with Thee ’ : and immediately there came to me a great peace.”—Another : “ All at once it occurred to me that I might be saved, too, if

¹ *The Varieties of Religious Experience*, p. 208.

I would stop trying to do it all myself, and follow Jesus ; somehow I lost my load.”—Another : “ I finally ceased to resist, and gave myself up, though it was a hard struggle. Gradually the feeling came over me that I had done my part, and God was willing to do His.”

Here then is the final wonder of the re-creative work as far as it is discernible to mortal powers ; namely, the living centre of control given up unreservedly to the guidance of the Divine Redeemer. The language of converts describing these great events may be weak and feeble, but however magnificent their literary effort might be, none could be adequate to express the true result.

But as a matter of fact, are the effects of conversion either great or lasting ?

To turn once again to a psychological investigation, limited to a hundred cases, but carefully carried out ; Professor James writes :—“ Discussing the returns more minutely, Starbuck finds that only six per cent. are relapses from the religious faith which the conversion confirmed.”¹

¹ *The Varieties of Religious Experience*, p. 258.

THE FACT OF CONVERSION. 167

His conclusion is that the effect of conversion is to bring with it "a changed attitude of life, which is fairly constant and permanent, although the feelings fluctuate. In other words, the persons who have passed through conversion, having once taken a stand for the religious life, tend to feel themselves identified with it, no matter how much their religious enthusiasm declines."

But for how many, on the other hand, conversion is a far deeper matter, leading, as in the case of Saint Augustine, from profligacy to true and lasting saintliness !

Thus by means of such personal re-creations as are here described, we pass to the larger but perhaps scarcely grander transformation, in which the community itself is made anew. In the beautiful language of the late Bishop Westcott : — " We can see now, as men could not see in earlier times, how there has been a law in the growth of the race : how man was taken from himself by the ancient organizations of the state : . . . and seeing this we can see also, when we let the Incarnation give its perfect message, that

he is given back to himself, to the world, to society in the Risen Christ. This then is the revelation which we have to embody in the eyes of all by some fellowship which shall strike the imagination; which shall teach by manifold experience the power of social relationships and social obligations in commerce, in politics, in religion; which shall claim for the family and the nation their proper parts in preparing the Kingdom of God upon earth, in bringing to redeemed humanity the fulness of its life in Christ.”¹

It would be obviously beyond the scope of our present subject to discuss any difference of aspect which may become apparent when the facts of re-creation or conversion are viewed under the respective lights of Christianity and psychology. The opinions of theology and psychology are by no means essentially discordant. For whatever may be discovered to be the actual workings of the brain, the Christian may rest assured that it will be but a revealing of the methods of the Almighty. Upon this point

¹ *Social Aspects of Christianity*, p. 145.

THE FACT OF CONVERSION. 169

Professor James remarks:—"If the grace of God miraculously operates, it probably operates through the subliminal door, then. But just *how* anything operates in this region is still unexplained, and we shall do well now to say good-bye to the process of transformation altogether, leaving it, if you like, a good deal of a psychological or theological mystery."¹

No doubt the workings of the subconscious mind may provide useful explanations of numerous mental facts. But no superficial tracing-out of the sequence of mental cause and effect must be mistaken for a negation of those invisible agencies which are the true internal causes of the external operations of re-creation.

CHRISTUS RECREATOR.

The main point which may guide us to the re-creative character of conversion, whether it takes the form of a sudden crisis or a gradual change, is that these occurrences centre so frequently around the personality of Jesus Christ. Genuine conversions have doubtless taken place and still

¹ *The Varieties of Religious Experience*, p. 270.

do so, under other dispensations than that of Christianity; but the facts of human experience show that Jesus Christ has proved the unique source of re-creative energy upon this planet. Around His Personality the mysteries of conversion have been manifested times without number, and in no other name do they occur in a similar manner. He it is who has always stood, and still stands, as the life of the Christian Church, ever re-vitalizing its flagging powers. No ideas of love, mercy, truth, and altruism, before His planting, were ever so successfully and systematically developed into fertility. Before His coming no such psychological crises arose bearing the manifold fruits of the spirit, and giving to a darkened world the glorious light of Apostles and Saints.

We must therefore open our eyes to facts as they are, and seek to find in Jesus Christ the explanation of those phenomena which have so obviously originated from, and centred around Him.

But the Christian believes that the re-creative power of Christ is not to be measured even by

the external evidences of conversions. Regeneration is a still deeper stage of re-creation. To quote the words of Dr Mason :—"Regeneration is a metaphysical change, altering a man's nature ; conversion is a moral change, altering a man's character. The one gives him new faculties, and a new sphere in which to exercise them ; the other gives a new direction to whatever faculties he has." ¹

THE SUPREME RE-CREATIVE INFLUENCE.

We have already noticed that the various chemical, mechanical, mental, moral, and other laws which rule over evolution, first came into action through being embodied in single individuals, and thence through the agency of the minority, became effective upon a larger number.

Now when the doctrine of the Incarnation is regarded in the light of this truth, we recognize an analogy to the method of moulding bodily development by embodiments of law ; but not an analogy only, but also a great contrast to this method. For not only was Jesus Christ an

¹ *The Faith of the Gospel*, p. 362.

Embodiment of the law of love, but in His Own Personality rested the origin, root, and centre of that law. The truth of this statement will become self-evident from the following facts. The Incarnation alone created the manifestation of that love. No human being could previously have pointed to the law of *perfect* love, nor could any have embodied it, for it was not extant in the world before the Incarnation. Thus the similarity to the evolutionary method mentioned above, consists of the fact, that Jesus Christ was an Embodiment of the law of *perfect* love,—if we may call it a law. But the contrast appears when we perceive that the origin, root, and centre of that law rested in His Own Personality ; and was not, in its true perfection, to be found in, or exemplified by, anything external to Himself.

The inherent receptivities of a Newton might enable him to recognize natural laws external to himself, and to point them out to others. But it was the *actual nature* of Jesus Christ, which alone enabled Him to show to humanity the true *nature* of a Divine Love. Men of genius have aided mankind by pointing to laws previously

undiscovered, but already existing in the world around them. Christ, in order to reveal the fact of a Divine Love, could only point to His Own Nature, and His Own Love as manifested by His Own Sacrifice of Incarnation. Newton *perceived* the law of gravitation. Jesus Christ *was* Love.

Further knowledge we may look forward to upon all subjects under the sun ; old discoveries may fade in importance before the appearance of new ones ; but the revelation of love given by Jesus is final and perfect. Although new light may dawn upon it, no fresh source of such love as that of the Redeemer to fallen man can again arise.

A perfect and superhuman love could only be revealed by One who was Divine. By virtue of His exalted Nature, and by that alone, was Christ enabled to present for human recognition and acceptance,—His incarnation,—His voluntary sharing in the results of lawlessness, and its penalty,—that most profound of all possible acts of self-renunciation. Hence the perfectly unique effect of that power which Jesus Christ has exerted upon mankind, and which Professor Seeley pointed to in the following passage :—

"Few indeed are those to whom it is given to influence future ages. Yet some men have appeared who have been 'as levers to uplift the earth and roll it in another course.' Homer by creating literature, Socrates by creating science, Cæsar by carrying civilization inland from the shores of the Mediterranean, Newton by starting science upon a career of steady progress, may be said to have attained this eminence. But these men gave a single impact like that which is conceived to have first set the planets in motion : Christ claims to be a perpetual attractive power like the sun which determines their orbit. They contributed to men some discovery and passed away ; Christ's discovery is Himself. To humanity struggling with its passions and its destiny He says, Cling to Me, cling ever closer to Me."¹

Here then is the great truth—Christ's gift to the world was *Himself*. Around His Personality may be seen the work of the re-creation of the spiritual element in man progressing as an undeniable fact of human existence.

¹ *Ecce Homo*, p. 198.

CHAPTER VIII.

THE UNITY OF THE RE-CREATIVE PROCESS.

Contents.

	PAGE
The Redemption as the counteraction of the Fall . . .	178
The unifying effect of the Redemption . . .	180
St Paul's testimony: Bishop Westcott, <i>Christus Con-</i> <i>summator</i>	182
The Birth of the Spiritual Organism the Church . . .	184
St Paul's references to the unity of the process of re- creation	187
St Paul's doctrine of the unique nature of the redemp- tive energy	189
Returning to a scientific standpoint	190
Transcendent phenomena which colour the whole process of evolution	193
The origin of the spiritual sensibilities:—Tyndall, Lang, Wundt, Wallace	194
Thought and Self-consciousness:—Tyndall, Wallace, Ward	197
The unity of evolution and the fallacy of Unitarian Panthéism	200
The doctrine of spiritual influences and of the Holy Spirit	203

“Behold, I make all things new.”—REV. xxi. 5.

CHAPTER VIII.

THE UNITY OF THE RE-CREATIVE PROCESS.

THEN on sweeping the whole evolutionary process with one comprehensive glance, its operations present a remarkable unity of purpose and achievement. It would be difficult to say whether the laws of heredity which hedge in the unconscious movements of growth reveal a more jealous and solicitous guardianship, than that which the principles of religion bring to bear upon the conscious actions. Both alike are rich with their respective gifts, and both too are surely ministers ordained of God.

Again, the re-creative change wrought out in individual souls, and the consequent uplifting of the whole community, stand at the end of organic development with all the significance of a divine

prophecy ; a prophecy also full of deepest comment upon the apparent aimlessness of the earlier stages of evolution. But a far brighter light still is shed upon the unity of the re-creative process, when we recognize the special manner in which the work of Christ has counteracted the results of the Fall.

*THE REDEMPTION AS A COUNTERACTION OF
THE FALL.*

Just as the first and most prominent operation of Christianity is the cleansing effect of its power, whereby dispositions, black with cruelty and evil, are illumined with love and grace of character ; and just as the second is the unifying operation of its influence, whereby all truly regenerate souls are as truly made one, in the one, pure, strong, corporate Body of the Universal Church ; so in striking contrast to these two operations, there stand out with equal distinctness the two main results of the Fall.

First, the feature of cruel ferocity ever present in the contest of animal strife, and becoming still

ONE PURPOSE, ONE PROCESS. 179

more hideous in the sin and rivalries of unregenerate man.

Secondly, the individualized and individualizing character of organic evolution, in which individuals and species are multiplied only to stand as isolated units warring against each other to the death. So far from being drawn together, they are as a rule forced into enmity and hatred by the very conditions of their existence. Conditions, be it remembered, which were entirely due to disobedience to the laws of a higher state of being.

If the *sin* depicted in the Fall brought about the association of a vital energy with matter, causing a vitiated material being and organic evolution as the only outcome, the *re-creation* of the spiritual element in Christianity is certainly producing an exactly contrary effect.

These then appear to be the ultimate spiritual effects of the Fall and the Redemption side by side, as they are visible in the world :—

On the one hand the manifestation of hatred, strife, and an unrestrained individualism which is ever aggravating its own evil.

On the other, the regeneration of the animal nature, the inspiration of love and lofty ideals, and the uniting of souls both into the oneness of the Social Organism,—the Christian Civilization; and into the still more complete unity of the Spiritual Organism,—the Church of Christ.

THE RESULT IS SPIRITUAL UNITY IN CHRIST.

Whether the work of individual re-creation advances to a crisis suddenly, constituting a conscious change of disposition such as is witnessed in sudden conversion, or whether it proceeds gradually throughout life, with a continuous unconscious growth of the spiritual powers, the result is of a similar character. It is not the embodying of abstract rules or principles in brain-tissue, such as we watched in physical development; it is no mere imitation of Christ's character, but the actual communication of a Divine life. It is not the embodying of a law, but of the spiritual life of a living Personality. As Christ Himself expressed it: "I in them and Thou in me, that they may be made perfect in one."

“I in them”: that is the only basis of the one true human unity; whether it be in its partial realization in this world, in a thoroughly regenerated society; or whether it be in the perfected Body in the world to come.

As regards the unified existence of the world to come, do not reason and our experience of sinful, fallen nature, both speak of the hopelessness of human unity, and the joylessness of that unity if it were possible, unless it be a oneness which shares in a life of absolute perfection and holiness; that is to say, unless it be a fellowship of re-created beings. But the oneness of a common nature recreated by Him, and sharing in Him the fulness of every grace, is the end to which humanity is lifting its eyes; and gazing, sees with the light of a quickened understanding, both the formative effect of the struggles of the past, and the constructive results wrought out by *partially Christianized* individualism in later times.

Thus the Incarnation gives meaning to the otherwise meaningless process of evolution.

The fulness of the explanation of human existence which flows from the doctrine of the

Incarnation is thus pointed out by Bishop Westcott: —“For me at least the thought of the predestined humanity of the Eternal Word, the Son of God, as the archetype of humanity, throws light, growing light, upon some points of the Faith, where many of us feel the darkness to be most oppressive. . . .

“It throws light upon the broken and chequered sum of human existence. It helps us to understand how the scattered fragments in which man’s potential endowments have hitherto been realized combine to form a whole. There is a law, there is a Head from the first. There is no absolute separation of men in the complex variety of their functions. Men, so to speak, furnish the manifold elements through which (in the language of St Paul) a body of Christ is shaped ; just as the world furnishes the elements through which man himself finds expression for his character. It throws light on the conception of personality. It helps us to understand how the self-assertion of the finite is sin and death ; and how the complete self-surrender of love preserves and fulfils that which is truly individual, by delivering it from the weakness of isolation, by

consecrating it to common service, by incorporating it in Him who is *the Life*. . . . It throws light upon the connection of man and nature. It helps us to understand how every discovery which encourages us to see an order in the unfolding of all things confirms the teaching of the revelation on the Divine method and the Divine end ; how the division, the differentiation of parts—call it as we will,—which culminates in man, points forward to a unity as well as backward : how the restoration of unity to mankind carries with it the restoration of unity to finite being.

“It throws light, yet once again, upon the mystery of the future. It helps us to understand how that existence to which we look forward is not a mere indefinite continuance of divided lives, in which each one dwells apart, but some higher type of a common life : a life in Christ : a life felt in the fulness of personal fruition to be His life, to which all in due measure offer that which is theirs : a life which thrills through each least member of the spiritual body with the intense and untiring joy of an absolute harmony. . . . ”¹

¹ *Christus Consummator*, pp. 105, 106.

*THE BIRTH OF THE SPIRITUAL ORGANISM
THE CHURCH.*

It is when this wondrous unity has burst into full view that we are best able to recognize the nature and functions of the Spiritual Body the Church. The formation of the Church proceeded directly upon the re-creative work within the soul of each individual Apostle, and the final crisis of that work came upon the day of Pentecost. Thus the life of re-created, purified unity of which Jesus spoke with such tender fervour, came into being upon earth, and is daily increasing under the Holy Spirit's guidance. That the formation of this re-created Body was a definite part of the work of the Redemption none can doubt. But less evident perhaps is the manner in which the re-created life of the Spiritual Body is by Divine method intended to flow into and re-form and vitalize the social body. If the formative guidance of social development be a true function of the Church, the season of ripening for social change would seem to be one of unremitting watchfulness and activity. The

THE BIRTH OF THE NEW BODY. 185

relation of the Spiritual to the social body is a subject suggestive of deep questionings.

Are social changes to be initiated by secular institutions and carried out upon secular lines, so that the re-formed organism shall become an embodiment of mental principles, instead of changing more and more into an organism growing with spiritual energy, and instinct with the oneness of a spiritual life? Is the socialism of the future to evolve an organism which shall be a more complete embodiment of the Spirit of Christ, or only of those principles which proved the natural guides of the earlier stages of development? Are the bonds which are to keep the socialistic community together to be the impotent chains of moral law forged upon the young by secular education? Or are the cohesive principles to be those of a *true* if only partial altruism born of the gift of regenerate being,—a gift of unity which cannot be bought with gold, which can be derived only from God's One Fountain; and nurtured only by those who themselves are striving to be meet partakers of the re-created life?

These differing lines along which human

societies may move towards development or the reverse, are well worth profound meditation. The contrast is as strong as that of light and darkness. The immediate divergence may appear but slight, but from the background of the past the truth shines out with all its terrible detail. There, in that past, we behold the individualized character of living beings only becoming more cruelly accentuated in the higher manifestations of life. Nothing can get rid of it. So bound up with life and natural conditions of existence is this eternal necessity for warring rivalry, that any cessation short of that caused by the quieting hand of death would seem to be a hopeless impossibility. But we turn from the natural conditions, to those of the partially recreated life of the Church. When, lo ! by the power of Christ the impossible has become an accomplished fact ! In this Body altruism lives as a new and divinely imparted spirit, nor can unbridled individualism dwell therein except in sinful pretence. Here by His might, effort and self-control are overcoming the ruthless energy of self-assertion. Here by the gradual transformation

THE BIRTH OF THE NEW BODY. 187

of character, generous devotion is working the miracle of lives consecrated to the service of others, and of riches laid down at the call of conscience. Here from His throne, proceeds that "ultra-rational sanction" for conduct, which is none other than the consenting benediction bestowed upon the altruism of confiding love. Thus, in spite of evil still persistent, in opposition to the errors of excessive individualism, in contradiction to some faithless theories of a premature artificial socialism; the Spirit of Him who was man's Creator is now working towards human re-creation.

ST PAUL'S REFERENCES TO THE UNITY OF THE RE-CREATIVE PROCESS.

It would seem that the entire length of the upward journey of evolution culminating in spiritual re-creation, is intentionally referred to by St Paul, as though his words would surrender their complete meaning in the light of future knowledge. He speaks of "the whole creation groaning and travailing together in pain *until now.*" The words "until now," involve an allusion to bygone periods of undefined length.

Alluding to the latter part of the upward journey, during which guidance was received chiefly through the moral law, he says, "So that the law hath been our tutor to bring us to Christ." The unity of process is distinctly implied by these passages, especially when read in conjunction with each other. Again St Paul speaks of the consummation of the re-creative work in Christ. Writing to the Corinthians he observes: "Wherefore if any man is in Christ, he is a new creature"; or as the marginal rendering has it, "There is a new creation: the old things are passed away; behold, they are become new."¹

Again, writing to the Galatians, his words are: "Even so we also, when we were children, were held in bondage under the rudiments of the world; but when the fulness of time came, God sent forth his Son, born of a woman, born under the law, that he might redeem them which were under the law, that we might receive the adoption of sons."²

"Bondage under the rudiments of the world"

¹ 2 Cor. v. 17.

² Gal. iv. 3.

and existence "under the law," refer clearly to earlier stages of human evolution before the fulness of time ; stages which were guided by physical, mental, and then by moral laws.

But if St Paul points to the unity of the re-creative process, he is never tired of emphasizing the unique nature of the Redemptive Power of Christ.

*ST PAUL'S DOCTRINE OF THE UNIQUE NATURE
OF THE REDEMTIVE ENERGY.*

Over and over again he repeated the teaching which is summed up in the words : "For ye are not under the law but under grace." Not that being "under grace" involved exemption from the claims of true physical and moral principles contained in the Mosaic Law. But it pointed to an entirely new guiding Influence, an Influence which not only would quicken the powers of perception to an almost unerring recognition of the right course of action ; but one which should be productive of a new life, with a new source of spiritual strength giving executive capacity to an impotent will. All the

Apostles fervently directed the attention of their hearers to this new source of help, this new re-creative Energy called "Grace" ; and verily their own records proved its efficacy. Human language has never compassed the mysterious nature of this Energy in any exhaustive definition. It has been described "as the saving Energy of Jesus Christ going out to the undeserving." Sufficient that it should remain thus, so long as its divine mercy, its vital importance, and its wondrous results are not passed over, or attributed to other causes.

Above the voices of the other Apostles, the emphatic clearness with which St Paul reiterated the distinction between the efficacy of law and the re-creative power of Christ, has doubtless had its weight with all generations of Christians, leading to a more or less complete recognition of the truth. But the depth of that distinction comes home intellectually to none more fully, than to the evolutionist. To one who has traced out the past stages of the re-creative process, watching both method and results of the great embodiment, it becomes a proven

fact, that after Christ, human society no longer remained dominated by principles and ideas formed according to the remorseless sway of physical laws and brute force. The mechanical reign of law gave way in Christ to the presence of the Lawgiver. The personal influence of affection superseded the impersonal guidance of law. True, a restraining force more binding than any, takes the place of the reign of mechanical law, but it is a force that gives life, as well as joy ; a force that, instead of cramping the feelings within rigid and finite boundaries, opens out an endless field of hope and activity, stimulating to endless development ; a force that arrests the deadly process of self-centralization, and the narrowing effects of solely mental activity ; a force that expands the soul into fellowship with a Divine life.

Thus the doctrine of St Paul lays stress upon the fact that the influence of Christianity is *entirely* spiritual, that its motive power is derived from one source only, from the personality of Jesus Christ. No amount of intellectual understanding, no philosophical wisdom, can take the

place of a spiritual fellowship with Him. The purely mental is different in kind from the inward receptivity which renders conversion and recreation an incipient or an accomplished reality.

With great emphasis St Paul insists upon the contrast between "fleshly wisdom" and "Christ the power of God." He distinctly states in his First Epistle to the Corinthians, that he has purposely avoided intellectual explanations, fearing that if he persuaded them in wisdom of words the cross of Christ should be made void. "For the word of the cross is to them that are perishing foolishness; but unto us which are being saved it is the power of God."¹

No language could state more clearly that the essential requisite for re-creation is not the spirit which awaits the coercion of intellectual suasion, but the spirit of humility which is ready and anxious to embrace the doctrines of truth and love. But if the power of Christianity be so entirely spiritual, what can be the value of the facts and reasoning of the foregoing pages?

Their sole usefulness must depend upon their

¹ 1 Cor. i. 18.

TRACES OF THE SPIRITUAL. 193

power of guarding against false views of evolution, and dispelling clouds which have already obscured from the eyes of some the glorious light of Christ. Without doubt, the transcendental spirituality of Christianity, appearing as it does as the most potent factor of the more final products of evolution, imparts an aspect of spirituality to the whole process. But there are other elements in evolution besides Christianity, which are possessed of a distinctly transcendent character.

OTHER TRANSCENDENT PHENOMENA WHICH COLOUR THE WHOLE PROCESS OF EVOLU- TION.

Of all futile and dangerous tasks, that of attempting to banish the transcendent element from evolution would seem to be the most hopeless and erroneous in principle. The phenomena of consciousness, thought, and religious instinct are so universal and prominent, that by far the easiest, as well as the most logical manner of dealing with evidence so direct and definite ; is to recognize that evolution is in its

essence a transcendent or spiritual process from beginning to end. How, for instance, apart from such an admission, are we to explain the origin of the spiritual sensibilities ?

THE ORIGIN OF THE SPIRITUAL SENSIBILITIES.

To suppose that they originated from the dry dust of an external machinery like natural selection would betroth us to absurdities which are beyond consideration. None who have attempted to find the origin of the religious sentiment in myths, have ever faced the true problem, which is, that the unaccountable element is not the particular form which religion may take, but the internal emotion in the human breast, which has so long outlived the change of outward forms, and proved itself a factor of the first importance in human life.

As the late Professor Tyndall put it :—
“There is also that deep-set feeling, which, since the earliest dawn of history, and probably for ages prior to all history, incorporated itself in the Religions of the world. You, who have escaped from these religions into the high and

TRACES OF THE SPIRITUAL. 195

dry light of the intellect, may deride them ; but in so doing you deride accidents of form merely, and fail to touch the immovable basis of the religious sentiment in the nature of man.”¹

What then is this internal living emotion ?

It is evidently a sensitiveness, a responsiveness ; but to what ? Not to lifeless laws, but to the living Lawgiver. It is an emotional sense of harmony with a living Personal Being. Out of this perception of a Personal relationship grows the inclination to obey His commands, the sanction for the ultra-rational law of conduct referred to by Mr Benjamin Kidd. Here we find the basis of the moral sensibilities, and a guarantee that the resulting actions will be such as will further the growth of the social organism upon the lines of true development.

Matthew Arnold was vaguely touching upon these facts when he described religion as morality touched with emotion.

Thus also Mr Andrew Lang, in his work *The Making of Religion*, concludes that religion has not been evolved from myth, but is due

¹ *Fragments of Science*, vol. ii. p. 196.

to those inherent receptivities in the depths of human nature, which have found expression in the words "Abba, Father !"

Professor Wundt's views are also identical :—
"We have nothing left that can serve as the specific contents of morality except certain psychological elements, which presuppose not any special external conditions, but simply the uniformity of human nature. And as a matter of fact, we find such elements in certain moral impulses which, while they may develop in very different ways, and therefore manifest themselves in a great variety of empirical forms, are nevertheless in essence always and everywhere the same."¹

To quote one more of the many authorities whose opinions tend to the same conclusions. Mr A. R. Wallace says :—"It is difficult to conceive that such an intense and mystical feeling of right and wrong (so intense as to overcome all ideas of personal advantage or utility), could have been developed out of accumulated ancestral experience of utility ; and

¹ *Facts of the Moral Life*, p. 327.

TRACES OF THE SPIRITUAL. 197

still more difficult to understand how feelings developed by one set of utilities could be transferred to acts of which the utility was partial, imaginary, or altogether absent. But if a moral sense is an essential part of our nature, it is easy to see that its sanction may often be given to acts which are useless or immoral ; just as the natural appetite for drink is perverted by the drunkard into the means of his destruction.”¹

Or to turn for a moment to regard—

THOUGHT AND SELF-CONSCIOUSNESS AS TRANSCENDENT PHENOMENA.

Said Professor Tyndall in his well-known Belfast Address :—“ Your atoms are individually without sensation, much more are they without intelligence. May I ask you, then, to try your hand upon this problem ? Take your dead hydrogen atoms, your dead oxygen atoms, your dead carbon atoms, your dead nitrogen atoms, your dead phosphorus atoms, and all the other atoms, dead as grains of shot, of which the brain is formed. Imagine them separate and sensation-

¹ *Natural Selection*, p. 201.

less ; observe them running together and forming all imaginable combinations. This, as a purely mechanical process, is *seeable* by the mind. But can you see, or dream, or in any way imagine, how out of that mechanical act, and from these individually dead atoms, sensation, thought, and emotion are to rise ? Are you likely to extract Homer out of the rattling of dice, or the Differential Calculus out of the clash of billiard balls ? . . . What baffles and bewilders me is the notion that from those physical tremors things so utterly incongruous with them as sensation, thought, and emotion can be derived. . . . You may say or think, that this issue of consciousness from the clash of atoms is not more incongruous than the flash of light from the union of oxygen and hydrogen. But I beg to say that it is. . . . The 'flash' is an affair of consciousness, the objective counterpart of which is vibration. It is a flash only by your interpretation. *You* are the cause of the apparent incongruity ; and *you* are the thing that puzzles me."¹

Again, Mr A. R. Wallace remarks :—" If a

¹ *Fragments of Science*, vol. ii. p. 167.

TRACES OF THE SPIRITUAL. 199

material element, or a combination of a thousand material elements in a molecule, are alike unconscious, it is impossible for us to believe that the mere addition of one, two, or a thousand other material elements to form a more complex molecule, could in any way tend to produce a self-conscious existence. The things are radically unlike, exclusive, and incommensurable.”¹

Or yet once again, Professor Ward, in his chapter upon Psychophysical Parallelism, writes : —“ Now on the psychological side we can at once point to a class of psychical events not psychologically explicable, viz. sensations. And on the physiological side there is certainly one fact which has so far baffled all attempts at physical explanation—I mean the fact of life itself. Here then, apart from any *a priori* considerations, we have empirical grounds for demurring to the parallelistic position ‘that the two things are on utterly different platforms—the physical facts going along by themselves, and the mental facts going along by themselves.’ Why sensations occur or recur, coexist together or succeed

¹ *Natural Selection*, p. 209.

each other as they do, no psychology can explain.”¹

Passing to the physical side, to the difficulties arising from the phenomena of life, the same writer continues :—“ The principle of least action is the crowning generalization of physics, that of self-preservation and betterment the first law of life. So diametrically opposed are the characters of the two that our eminent physicists with scarcely an exception proclaim the problem of life to be ultraphysical.”

*THE UNITY OF EVOLUTION AND THE
FALLACY OF MONISTIC PANTHEISM.*

Never could true science be led, even in the eager pursuit of demonstrable truth, to attempt to solve a difficult problem by omitting to account for the value of a component factor. But a prominent instance of this may be found in a desire shown in some quarters to advance a creed of Monistic Pantheism as coinciding with evolutionary phenomena. In this system the Divine Nature of Jesus Christ, which, as we have seen, is

¹ *Naturalism and Agnosticism*, vol. ii. p. 25.

A DANGEROUS FALLACY. 201

the only factor answerable for the sound development of the social organism, and the corporate existence of human spiritual life, is treated as a non-existent quantity to be casually left out of the evolutionary problem at will.

How can any system of unitarian foundation suffice to account for what has already taken place in social evolution ?

This development which has taken place within the last 1900 years embraces an extremely large area of evolutionary results of which science cannot ignore a single phenomenon. No explanation of Christian civilizations can be given apart from Christianity itself. In the Personality of Christ and in Christian civilizations, we have cause and effect side by side. As an undeniable fact, this most perfect type of social organism has only been evolved under the guidance of the spiritual power of Christ ; and who will face the records of history and maintain that such a vigorous, sound, and true social development could possibly have been evolved under any other influence ? The mind may shudder at the thought of miracle, and reel in bewilderment at

the transcendent light of the Resurrection ; but as eloquent of its origin as the skeleton of man itself, the foundations of civilized society reveal the principles and truths upon which they have been built, and which they must continue to embody if they are to prove equal to the strain of further growth, and capable of resisting the corrosion of disintegrating elements. It is evident that neither Monism nor any system of philosophy which does not take due account of the Incarnation can hope to explain evolution, or even to fit in with its phenomena. Of all people the evolutionist will perceive the significant light which these more final phenomena cast upon all previous stages of development. For him the unity we have mentioned presents indeed one tremendous miracle. But before its light the alternative of a myriad mysteries vanishes like darkness before the sun.

In dealing with the various facts of evolution brought forward in these pages, nothing has been said of the deep mysteries connected with the personal spiritual agencies which Scripture mentions as affecting human life for weal or woe.

*THE DOCTRINE OF SPIRITUAL INFLUENCES,
AND OF THE HOLY SPIRIT.*

Upon no subject is Biblical teaching more plain and consistent than upon the existence of differing orders of spiritual beings. And not only so, but the facts regarding the one evil personality are equally distinct. To him is attributed the ruin of the past, and the source of evil inspiration at the present. Under his influence every issue in the work of re-creation is opposed at every step.

The verification of this teaching must of necessity rest with each individual. It depends upon what each man sees of the deeps of his own soul and his own experience ; it depends upon what he can observe within the records of human evolution.

But in contrast to this revelation, gloriously bright in its promise of life and power and holiness, is the doctrine of the Comforter. Uniform with the whole Creed, interwoven with the Sacred Writings, and consistent with the divinely beneficent character of the Christian Faith, is the doctrine of the Holy Spirit. No

wanderer, however far from the path of truth, will ever seek His aid in vain. No soul, however impotent, lifeless, and defiled, will ever fail to receive the inspiration of His quickening power, wherever it is sought in true prayer. Isolation from factors formative of body and mind is a thing by no means unknown. But of isolation from God's Spirit there is none, to the soul who seeks Him; perchance not even in the lowest depths of hell. Neither vast expanse of sea or ocean, neither deadly solitude amid jungle or upon scorching desert, neither the corrosion of foulest disease, nor the haunting presence of criminal deeds, nor the very grip of death itself, can set a barrier against this Divine Messenger of love and comfort. Here no physical truths can be called in to confirm or illustrate, but for all that, this knowledge is in many cases as firmly implanted in the human soul as any other. From the earliest ages of man's awakening, the appeal of the sin-stricken conscience has been in substance the same, the same cry from the depths of helplessness, "Take not Thy Holy Spirit from me."

CHAPTER IX.
CONCLUSION.

“Let knowledge grow from more to more,
But more of reverence in us dwell ;
That mind and soul, according well,
May make one music as before.”

TENNYSON.

CHAPTER IX.

CONCLUSION.

JUST as it is the more final results of evolution which reveal most clearly the actual nature of the whole process ; so it is also these later stages which convince the mind that Divine Selection and not Natural Selection most truly describes the general method by which organic development and human progress have been worked out.

We have now completed our outlook upon evolution, and have watched the action of the wonderful set of laws which have guided the extraordinary series of developments from the primary shudders of living protoplasm up to the issues of the present hour.

Here they are, those wondrous laws, at this moment, as mercifully persistent as ever ! Amid the weird gloom of primeval desolation, they were at work with an accuracy as minute then as that which they exhibit to-day. They were actively moulding the foundation-work of the human body, arresting erroneous movements, and furthering each step, according to their immovable potentialities. No organs or limbs coming under their scrutiny were passed without a more or less detailed conformity to demands ever ready to exact a still fuller obedience. No germs nor physiological units survived the fiercest centres of trial, to be handed on as the chosen groundwork ; except those which were organized in strict correspondence to physical laws. As arbitrators of the ceaseless claims of animal contests, these laws have never worked without a tremendous complexity of co-operating principles focussing their united effects upon those very issues of bygone eras which some have attributed to mere chance. When we remember the dead set which the guiding laws have made against the predominance of

purely bodily development ; when we watch the huge forms of prehistoric monsters apparently invincible in armour and strength, vanishing before invisible but irresistible laws like smoke before the wind ; when we ponder over the unaccountable way in which the formative influence of brute force, in spite of its show of omnipotence, has given way all along the line to such shadows as æsthetic, mental, moral, spiritual, and social factors ; when we gaze upon these abstract principles at work beneath the external processes, delineating the outline of bodily development, and actually taking shape in tangible form in flesh and blood ; whatever sense of impossibility and bewilderment may blind the powers of recognition, this fact will surely become impressed upon us :—the process cannot be an aimless one ; it bears all the marks of a Divine intelligence and purpose. If the whole travail of evolution were repeated ten thousand times, the outcome under those unerring laws would be the same manifestation of living beings, the same moulding of shape, the same marvellous equipment of organs, and the same resourceful school for

corrective discipline. Then, lastly, and most important of all, human life amid those spiritual influences which have reached this planet, could only culminate in the Church of Christ,—a Church wholly dedicated with all her promise of inward holiness, and all her eager use of outward links with beauty and with God ; to the one great object, the re-creation of souls and the joining of them together in the bonds of a regenerated and sanctified society.

In the name of truth, we may well ask again, if, apart from the visible intervention of the finger of God, any evolutional process, natural or spiritual, could be more eloquent not only of design and beneficence, but also of majestic splendour and awful power.

Surely “ hell’s loudest laugh ” could never ring with more bitter irony than when this wonderful panorama, instinct as it is with life and spiritual being, is scanned from end to end by human eye, and pronounced in serious unprejudiced wisdom to be devoid of all spirituality and significance, the probable result of incomprehensible chance, and of an inadequate and impossible lifeless

mechanism. Never, surely, could mortal heart be sadder than when the many-voiced wonders and beauties of nature, fail to speak one single word of nature's God.

Not without a thrill of awe and praise can we look back across that dark expanse of countless ages, to a period when the laws of God were there, but man was not ; when nowhere upon this planet from pole to pole was there ought but formless energy, that shadowy progenitor of the complex human body that was to be ; when beneath the deadness of that void and agelong silence, the soul of every noisy bustling scene of modern life remained alive.

We have now traced out the great embodiment of these forces in vaguest outline ; but even thus, each step is full of wonder. And if this be true of parts, what can be said of the whole astounding result ; the partially complete edifice which confronts us to-day ? Misty vapours of the dawn still overhang parts of the building, completely obscuring some of its features ; but the general outline is so striking that there is no mistaking its character. It will make no difference what the

hidden details turn out to be, whether at some far-off stage of development an additional influx of "fallen" energy brought the birth of humanity, or whether the spiritual capacities now belonging to man, were potentially present in the primary forces to which the process has been due.

Whatever may be the value of some of the factors still concealed from our sight, whatever may be the method by which some of the intricate details are being worked out ;—the main building itself is so far complete, that its general character is unmistakable. It is no unsightly heap of dry bones scarred by the incidental action of the elements, and driven together by the mechanical violence of physical forces. The edifice of evolution as it exists to-day, stands out against the impenetrable depths of the future, a mysterious, but a magnificent structure. Its foundations and outlying courts are innumerable, stretching away in endless radiations into the dim background of animal life. But however varied and lowly its surroundings, however broken its main outline, however loosely con-

nected the units of its structure, the building possesses all the mystery and promise of a wondrous and harmonious unity. It is a Living Temple being daily and hourly wrought out by spiritual means from partial deadness. It is Humanity,—still awaiting many a re-formation, many a change, until the last great change to unchanging day.

Appendix.

THE TESTIMONY OF NATURAL HISTORY REVEALING DIVINE GUIDANCE BY FORMATIVE LAWS.

CHAPTER I.

THE MAIN PROGRESSIVE MOVEMENT IN THE WORLD OF NATURE.

Contents.

	PAGE
The embodiment of various physical principles giving power to kill and to resist elimination . . .	217-234
The embodiment of chemical principles . . .	221
The embodiment of mechanical principles . . .	223
The embodiment of electrical laws . . .	225
The embodiment of laws of light . . .	226
The embodiment of laws of sound . . .	229
The embodiment of laws of smell, taste, and touch . . .	231

CHAPTER I.

THE MAIN PROGRESSIVE MOVEMENT IN THE WORLD OF NATURE.

THE object of dealing in these pages with details of natural history is to show in as brief and simple a manner as is possible, the way in which various laws have gradually directed the movements of growth by means of animal interaction.

Here we are confronted by the two contrasting results already referred to.

On the one hand, there are animals which have always entered more or less freely into competition, which have developed a well-balanced and complex organization embodying a large number of principles ; and thus been placed in close correspondence with the prevailing laws. These animals constitute the direct line of ascent through the higher mammals to man.

On the other hand, there are numerous beings

of all kinds which have never entered freely into competition, which have developed in their bodies no powerful combination of physical principles, but which have survived solely by escaping the action of stronger animals by flight, concealment, repulsiveness, diminutive size, or some curious subterfuge.

All along the line of the upward movement, these organisms have been in evidence in every era. They represent the inevitable and often useful side-issues of the main current of evolution. The distinction between these two classes of animals is very marked.

*THE MAIN PROGRESSIVE MOVEMENT IN
THE WORLD OF NATURE.*

Although the same laws are often embodied by animals belonging to both classes, they are used in a different way, and lead to very different results. In fact, there is an essential contrast in a fundamental principle of existence in the two groups.

In the one case, the laws are embodied so as to *give power to kill and resist elimination*, according to the demands of unrestricted interaction. This of necessity means progressive development.

GUIDANCE BY PHYSICAL LAWS. 219

In the other case, they are embodied with a view to *escaping the action of stronger animals*, and sometimes the interaction of all other species. Here the result is exactly the opposite, for it leads to no further bodily development, nor to any additional power of utilizing the forces of nature.

Then, if an outlook into the world of nature shows animals responding to the possibilities of growth in very different manners, utilizing the same laws in a great variety of ways, and basing their claims for survival upon different uses of the same laws ; the broad distinction just mentioned will always be visible, constituting signs of order which become more and more apparent with each stage of progress.

THE EMBODIMENT OF PHYSICAL PRINCIPLES.

The physical principles embodied in the organic world are of course innumerable. But without attempting scientific exactness or an exhaustive list, they may be summed up in a cursory manner under the following six headings. This will render the subject sufficiently plain to demonstrate

the lines upon which animal interaction has proceeded. We meet with embodiments of :—

- (1) Chemical principles.
- (2) Mechanical principles.
- (3) Electrical principles.
- (4) Laws of light.
- (5) Laws of sound.
- (6) Laws which determine the phenomena of smell, taste, and touch.

Now through the world of nature we are constantly coming across these principles embodied in various ways, and in different combination ; but always with one or other of these two results :—Either so as to give a power to kill and to resist being killed ; or else in such a manner as to confer a partial or complete immunity from the action of stronger animals.

Let us first briefly examine a few instances of the way in which these laws have been embodied so as to give the power of eliminating and of resisting elimination.

Afterwards it will be well to notice the same set of laws being embodied with a view, not of interaction, but of isolation.

(1) *THE EMBODIMENT OF CHEMICAL LAWS
GIVING POWER TO KILL AND TO RESIST
ELIMINATION.*

Before speaking of the various weapons and armour which animals use in battle, it is necessary to point out that chemical laws underlie the composition of every cell, and by chemical laws they are being constantly repaired.

A very large number of organic movements are determined by chemical principles. Most chemical actions are known to have their special use in the economy of organic nature. Every living substance is full of examples of chemical action. Not only is the organization of blood, bone, and muscle based upon the dictates of these laws, but they are also determinant factors in the composition of the special tissues of the sense-organs, as well as in an animal's particular colour or smell.

As remarked before, these numerous combinations, whether found in fluid or solid, cannot be regarded as chance compounds. Their selection proves that they have a definite relation

not only to chemical laws, but to various other principles which have been factors in their preservation.

Again, chemical laws play an important part in the development of animal heat.

Now, although this set of chemical laws supplies such a complete basis for progressive bodily development, and is so fully adequate to human needs ; apparently it could not exist without creating opportunities for unusual embodiments, which by virtue of the laws made use of, must give further power to the animal in which the additional embodiment has occurred. For instance, in contrast to the ordinary embodiments of chemical principles which with slight variations are common to most of the higher animals ; poisonous snakes, reptiles, and insects, together with a few fishes, represent a class of beings which derive considerable advantage from their special use of chemical laws.

The principles embodied in the elaborate poisonous weapons of the lower animals are easily recognized, and are sometimes identical with those used by man.

GUIDANCE BY PHYSICAL LAWS. 223

It is a remarkable fact, and one which throws a significant light upon the definite nature of the guiding laws, that in spite of the additional power gained by the abnormal embodiments of chemical principles; the result has not been progressive bodily development; but as the life-history, for instance, of snakes shows, it has led to the degeneration of limbs, and the possession of a distinctly lowly structure.

(2) *THE EMBODIMENT OF MECHANICAL PRINCIPLES GIVING POWER TO KILL AND TO RESIST ELIMINATION.*

The mechanisms employed by animals in warfare, may be divided into two classes; namely, *weapons* used for inflicting wounds, and *armour* for preventing injury.

With regard to instruments for inflicting wounds, by far the largest class consists of weapons for piercing and tearing, such as teeth and claws. These are all constructed upon mechanical principles. The structure of the lion may well be mentioned, as an example of

a systematic use of leverage, coupled with that of wedge-like teeth and claws. The buffalo, on the other hand, relies upon weight, powerful horns, solid frontal, and force of impact. The elephant, besides his means of offence, has a hide which is often proof against wedge and lever.

Thus without going into further details, it is clear that in whatever manner attacks are made or repulsed, both weapons and armour must strictly embody physical principles, if they are to escape destruction. Victory is often determined under complicated conditions. Sharp teeth are sometimes matched against blunt ones which have an extra force behind them. Short limbs made for agility encounter those made for supporting weight. But in spite of all diversity of form and structure, all appeal to the same set of physical principles for survival. Intricate cross-issues are the order of the day, but the verdict is given according to infallible principles. And so among the bewildering turmoil of animal warfare the immovable set of physical laws has performed its appointed work.

(3) *THE EMBODIMENT OF ELECTRICAL LAWS
GIVING POWER TO KILL AND TO RESIST
ELIMINATION.*

It has been proved by an extensive series of experiments, that the nerve-force which leads to muscular action, is at least akin to electricity. Electric stimulation applied to the nerves of dead limbs produces muscular motion, whilst continuous electric currents induce stronger action in some organs, and distinctly affect the growth of plants. The bodies of all healthy animals appear to generate a certain amount of electricity for their own use. There is then, in all healthy animals, a normal embodiment of electrical principles.

But here again, the existence of electrical laws, so necessary to animal life, creates also the possibility of abnormal embodiments. Far more complex than the poisonous weapons of snakes, are the electric organs of certain fishes, such as the torpedo and the electric eel.

On account of the obscure nature of electricity, it is impossible to trace out the extent

to which it becomes a factor in animal contests. There can be but little doubt, however, that no developed nervous system could flourish without structural conformity to electrical principles.

(4) *THE EMBODIMENT OF LAWS OF LIGHT
GIVING POWER TO KILL AND TO RESIST
ELIMINATION.*

The laws of light have affected evolution most profoundly. They are utilized in three ways :—

First, in nutrition and growth.

Secondly, in the structure of the eye. By its means the laws of light are used in all the ordinary actions of the day.

Thirdly, they are used in the colouring of skin, fur, feather, and scales.

In the eye, these laws are embodied so as to *receive* vibrations ; in colour and marking, they are used to *cause* them. The latter conformity to principles of colour is of great value through sexual selection.

But most important of all the effects of light, has been the development of instruments of vision.

GUIDANCE BY PHYSICAL LAWS. 227

Of these evolution has produced three different types.

Here again the definite formative power of the guiding laws becomes evident. For with the exception of crabs and a few other crustaceans, which among other advantages are protected by a complete suit of armour, not a single large animal has survived which is not equipped with the most perfect kind of eye, and that in a high state of development.

The simplest kind of eye consists of a group of pigment-cells covered with a transparent skin with a nerve connection. These organs possess no lens conforming to the laws of refraction. Consequently they do not admit of perfect vision, but since their organization does embody the laws of radiation, they are capable of conveying the difference between light and darkness, or a faint adumbration of an approaching object.

More perfect than these are the instruments belonging to the class Articulata.

The eyes found in this group differ greatly, ranging from the kind of organ just spoken of, to the compound eyes of insects. The laws of

refraction are responded to in this case by means of numerous lenses placed side by side like bundles of telescopes pointing in many directions, but recording the impressions received at one nervous basis.

In contrast to these imperfect instruments, we have the type found in all the higher animals. It may not be perfect, but is a most wonderful embodiment of the laws of light, and of countless other principles, from the various muscles which move the eyeballs and eyelids, to those which are employed in the different humours, the tough and soft coatings, and in the marvellous construction of the retina and its nerves. In this instrument, instead of many lenses turned in different directions, there is one lens which can be set at various angles, thus conforming to the requirements of the laws of refraction.

It is obvious that perfect eyesight and an exact co-ordination of eye and muscle have for ages been most important factors in animal warfare. The laws of light underlie many essentials of brain development, since endless

acts of perception and their succeeding mental processes, depend entirely upon them.

(5) *THE EMBODIMENT OF THE LAWS OF SOUND
GIVING POWER TO KILL AND TO RESIST
ELIMINATION.*

Apparently the laws of sound have brought about results almost as important as those produced by light.

Two distinct sets of organs have been brought into existence by the agency of the laws of sound, —the *percipient* instruments for receiving the vibrations, the *causal* organs for originating them. The former consist of ears, which vary in their construction ; the latter of vocal cords, the stridulating or humming instruments of insects, or of feet or wings used for drumming.

As is the case with the laws of light, the laws of sound are not embodied with such fulness and detail, in structures of the lower animals, as in the more perfect products of evolution.

In the Articulata, the ear consists of a sac containing fluid in which the auditory nerve is expanded. The vibrations are communicated

from without by means of a membrane, or through the hard material of the head. The ear becomes more complicated in the higher forms of life, until it reaches its fullest development in man.

Ever since the first sounds of wind and rain reached the existing rudimentary organisms, long before any living creature was able to emit a cry, these laws were at work laying the foundation of the percipient instrument before any voice could be of use.

With regard to instruments for causing sound, by far the most effective is the end of the windpipe. All animals which breathe through a windpipe use the muscles at its extremity for emitting noises. The vocal apparatus of the lower animals is not so fully developed as that of some birds. In all cases the capacity for uttering only a few tones is of use for call-notes, for warning, and also in pairing. Gregarious habits would often be useless without means of warning at the approach of danger. Members of the dog tribe hunting in packs, with their noses on the ground, would be subject to separation, and

GUIDANCE BY PHYSICAL LAWS. 231

would never meet the foe in full force, were it not for a constant employment of the laws of sound.

Thus even in the interaction of the lower animals, every embodiment of the laws of sound has met with its full reward. In human development it is clear that the possession of even the most rudimentary language must involve the greatest gain ; whilst every additional capacity of uttering or distinguishing new sounds must also have had its full value in the struggle for life. Through such an uphill course as this, the laws of sound have asserted their influence, until they have become fully embodied in the human vocal cords, that most perfect of all instruments ; an organ capable of expressing as nothing else can express, some of the soul's deepest feelings.

Is not the travail of ages justified by the result ?

(6) *THE EMBODIMENT OF LAWS OF SMELL, TASTE, AND TOUCH, GIVING POWER TO KILL AND TO RESIST ELIMINATION.*

The laws which determine the phenomena of smell have exerted a certain influence upon the trend of bodily development, although perhaps

not an important or a marked one. These principles are also embodied in the two distinct organs, the one percipient and the other causal.

The causal organs, such as the scent-glands found in animals, have but one function, which is to originate odours which are beneficial to their owners. Glands of this kind are only useful to freely competing animals for sexual purposes. The protective use will come before us later.

The power of smelling is of great use to most animals in enabling them to track and to find food, and also to discriminate between various kinds. It is of further use in discovering enemies, and also in finding the opposite sex.

(7) *THE EMBODIMENT OF THE LAWS OF TASTE.*

In the tongue, the organ of taste, we have an elaborate apparatus embodying the laws which govern certain chemical motions giving rise to the sensations of taste.

The nerves of taste deal with matter in a fluid, solid, or pulpy form ; whereas those of smell are affected by molecules of extreme minuteness dissipated in an atmospheric medium.

GUIDANCE BY PHYSICAL LAWS. 233

Sensations of taste are originated through the medium of nerves within the papillæ on the tongue. The peculiar motions set up by substances upon which saliva has acted, are by their agency passed to the brain, and hence the resulting flavour. Thus the organ of taste embodies definite laws by means of which its functions are possible.

Taste is apparently necessary, not only in enabling animals to reject unsuitable food, but also in creating appetite, and the necessary flow of digestive secretions. With all animals, taste and relish lead to hearty meals, and to the sound action of the organs of digestion.

Under these circumstances it would seem that the organ of taste is an indispensable factor in the development of bodily strength, and that the laws which govern its actions have played a more important part in bodily growth than is at first sight apparent.

(8) *THE EMBODIMENT OF THE LAWS OF TOUCH.*

The sense of touch is rendered less useful to some members of the lower creation because

their bodies are covered with fur, feathers, or scales ; and with the exception of the monkey tribe they have no hands.

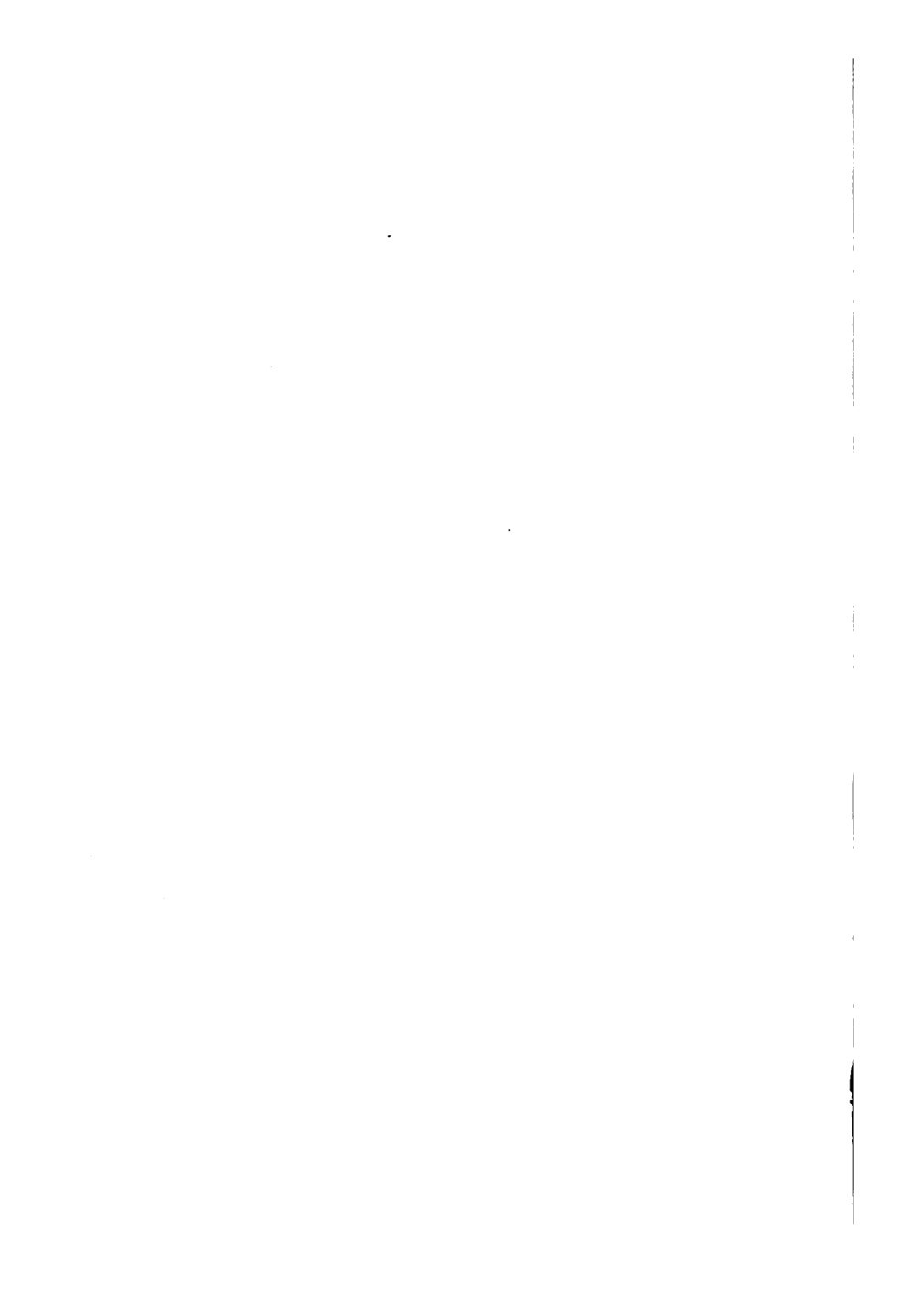
But still the cutis or true skin of all animals contains nervous filaments capable of conveying definite impressions by touch. The lips and noses of all animals, especially herbivora, are readily able in this way to discriminate by the sense of touch. The human hand, with its ridges and numerous papillæ, is a perfect organ of touch ; but beyond the fact that the young of mammals are dependent upon a fine sense of touch as well as smell, in finding the teats of the mother ; it is not clear to what extent the principles authorizing this sense have influenced the bodily development of the lower animals.

CHAPTER II.

SOME SIDE-ISSUES OF THE MAIN MOVEMENT WHERE
ESCAPE FROM FREE INTERACTION HAS PRE-
VENTED THE ACTION OF THE FORMATIVE LAWS.

Contents.

	PAGE
Partial or complete immunity from the action of stronger species gained by a peculiar use of :—	
Chemical laws	238
Mechanical laws	240
The laws of light	242
Inaccessible shelters	246
A diminutive size	247



CHAPTER II.

SOME SIDE-ISSUES OF THE MAIN MOVEMENT.

As we have already noticed, the laws which have guided the evolution of the higher animals, apparently could not exist without creating opportunities for their embodiment in various ways other than that which has proved to be the progressive type. By way of dealing briefly with some of the examples referred to, let us take a few instances of organisms which have made such a use of some existing laws, as to enable them to escape others which would have demanded their higher development on penalty of extinction.

A striking contrast exists between this group, and the animals we were concerned with in the last chapter. There, bodily strength, weapons and armour, were everything. Here the motto is, "to conquer by flight or concealment." With these, the most important factor of survival is, a

“capacity for wriggling,” getting away from superior strength anyhow and anywhere. There, amid the comparatively open competition the action of the formative laws was unrestricted. Here, various isolating influences are at work, suspending the action of these laws on all sides.

The entire group, for our present purpose, may be conveniently divided up as follows :—

Organisms which gain complete or partial immunity from the action of stronger species by means of :—

- (1) A special use of chemical laws.
- (2) A special use of mechanical laws.
- (3) A special use of the laws of light.
- (4) The use of inaccessible shelters.
- (5) A diminutive size.

(1) *ORGANISMS GAINING COMPLETE OR PARTIAL IMMUNITY FROM THE ACTION OF STRONGER SPECIES BY MEANS OF A PECULIAR USE OF CHEMICAL LAWS.*

In contrast to the normal embodiment of chemical laws which is found in freely competing

ESCAPE FROM INTERACTION. 239

animals, there are many instances where chemical principles are used in an unusual way, in order to give immunity from the foe.

Thus the squid secretes an inky fluid by which it darkens the water and veils itself from its enemies.

A large group of beings, including several species of mammals, reptiles, fishes, insects, and larvæ, have escaped the tests of physical strength by developing a nauseous flavour, a foetid smell, or a prickly or a hairy skin.

Among mammals, the skunk is best known for its odoriferous powers, and the shrew-mouse is rejected as food for a similar reason.

Many larvæ are distasteful to birds. Lady-birds and soldier beetles and many butterflies enjoy safety through a similar use of chemical principles. Other species of beetles and insects save themselves from attack by ejecting repellent fluids. Toads have the same habit, whilst snakes emit a strong odour, and neither are generally sought after by carnivora.

The advantage of having a repulsive odour or taste is not complete, unless its happy possessor

has also some conspicuous colour or marking which can be recognized at a glance as a distinctive warning.

Thus a use of the laws of light, in combination with certain other physical principles, affords a remarkable kind of isolation, whereby survival is attained without any development of bodily or mental strength, which is the normal requirement.

(2) *ORGANISMS GAINING COMPLETE OR PARTIAL IMMUNITY FROM THE ACTION OF STRONGER SPECIES BY MEANS OF A PECULIAR USE OF MECHANICAL LAWS.*

Most of the mechanical principles which play such an important part in the structure of the higher animals, and are so necessary to the foundation-work of re-creation, are also embodied in some contrivance by means of which an undeveloped species obtains survival. Spiders, beetles, flies, and parasites of all kinds, reap the benefit of using levers, hooks, and sharp points.

Again, the laws of locomotion, which are so necessary to higher development, render possible the existence of many beings of a very rudi-

ESCAPE FROM INTERACTION. 241

mentary type. As we have already observed, without opportunities for rapid locomotion, physical laws would have produced a very different result upon bodily evolution. If there were no such thing as escape by flight, how many thousand powerless species would be non-existent! There would be no limbs formed for rapid locomotion, and there would be no swift unarmed herbivora, such as members of the deer family. In such a case, the trend of evolution would have been towards the production of massive strength. Under existing conditions the laws of locomotion, together with those which operate through sexual selection and social habits, have combined in modifying the effects of brute force, and have hit off a visible balance of development.

But even with undeveloped species which would rapidly become extinct were it not for flight, powers of locomotion are seldom relied upon as a sole means of protection. The advantages of small size and inaccessible shelters are usually also a part of the scheme of survival. Rats, mice, rabbits, and many reptiles adopt these

methods. They seldom wander far from shelter, are adepts at making use of every kind of cover, gaining survival on land in the same way as birds escape elimination by flying.

(3) *ORGANISMS GAINING COMPLETE OR PARTIAL IMMUNITY FROM THE ACTION OF STRONGER SPECIES BY A PECULIAR USE OF THE LAWS OF LIGHT.*

We now come to a curious use of the laws of light, colour, and sight; laws which in themselves have proved indispensable to progressive growth.

Animals, birds, fishes, reptiles, and insects, frequently possess a partial immunity from foes owing to a similarity to their surroundings. For instance, the reason why imitative insects manage to survive, is not because there are no laws which would arrest their existence amid stronger animals, but because by an incidental likeness to something else they have been enabled to escape those laws. Almost all existing species of insects which move in the daytime, and do not retreat under earth, leaves, fur or feather, owe their survival either to

ESCAPE FROM INTERACTION. 243

being repulsive, or to a deterrent or deceptive appearance.

This fact clearly shows that the existence of these beings is almost forbidden by the guiding laws, since they have caused the extinction of all similar species which have not been able to escape their effect by some special means such as those we are dealing with.

Besides peculiarities of appearance, some insects build shelters, like the caddice-worm, to deceive their enemies. Some pupæ, fishes, and reptiles adopt a colouring in keeping with their resting-places.

The above are a few of the many cases in which the effective action of the formative laws has been avoided, resulting in the survival of rudimentary organisms.

Since we are dealing with matters of sight and perception, it would be well to refer here to a further way by means of which some weak animals escape extinction—namely, by moving at night.

This way of shunning the action of highly developed animals is far less important than the

methods mentioned above, for the simple reason that night is a very busy feeding-time for both large and small carnivora, as well as for owls, bats, toads, and various reptiles.

Perhaps the organisms which derive most benefit in the way of protection from nocturnal habits, are those which would be devoured by birds if moving in the day. Edible snails and slugs would probably have become extinct long ago if they did not move by night and remain hidden during the day. Earth-worms seldom come to the surface with impunity except at night. Many larvæ also which are concealed during the day, are visible at night. The same is the case with numerous species of beetles and moths. With the exception of bats and night-jars and some owls, these creatures have no winged foes to contend with ; whereas exposure by day would mean wholesome slaughter from the attacks of birds. The only day-flying moths which have survived their devastations, are those which are protected by rapid flight or some of the means already mentioned. Here then are a few more instances of the way in

ESCAPE FROM INTERACTION. 245

which the various principles of the complex network of existing laws are played off against each other by living embodiments. No doubt the survival of hosts of insects and lowly organisms, does at first sight suggest that the laws which condition evolution have no tendency towards producing any higher types; but the aspect of things soon changes when we weigh duly the meaning of these various subterfuges by means of which alone they can manage to exist.

In contrast to the varied abnormal uses made of the laws of light and sight for avoiding interaction, it is noticeable that the laws of sound have not resulted in a variety of peculiar embodiments having special protective value.

It is true that laws of sound, which, as the basis of language, have proved of such vital importance to the growth of civilization, are also quite essential to the survival of many weak animals, in enabling them to perceive the approach of danger. Conformity to these laws has resulted in many cases in definite advantages, as in affording means for uttering warnings, call-notes, and deterrent sounds. Principles of sound also crop up as

factors of value in sexual selection. But they do not seem to have given rise to any peculiar embodiments endowing the possessors with exemption from open interaction.

(4) *ORGANISMS GAINING COMPLETE OR PARTIAL IMMUNITY FROM THE ACTION OF STRONGER SPECIES BY MEANS OF INACCESSIBLE SHELTERS.*

The physical laws which have determined the rugged nature of the earth's surface are also answerable for, or rather an important factor in, the survival of many undeveloped organisms whose destruction would immediately follow a change in these conditions.

A great deal has been said about the effect of geographical isolation, but its general importance is not nearly so great as the immunity from attack which is enjoyed by both external and internal parasites, by virtue of the peculiar localities in which they live.

Besides these beings, as we have already observed, there are a great many other organisms whose survival is due to inaccessible shelters, and not to any superior bodily development.

ESCAPE FROM INTERACTION. 247

(5) *ORGANISMS GAINING COMPLETE OR PARTIAL IMMUNITY FROM THE ACTION OF STRONGER SPECIES BY MEANS OF A DIMINUTIVE SIZE.*

It would be difficult to overstate the importance of this factor in determining the survival of many minute beings both on land and in water. As we should expect, natural selection has left a graduated series of organisms in every competitive circle, representing food-animals and their eaters. But this does not mean that smallness gives no immunity from larger species. Thus, whilst a diminutive size does not involve exemption from competition, it does remove the species from interaction with highly developed animals, and therefore from the effective action of the laws which they embody.

The devastating swarms of rats, mice, rabbits, locusts, beetles, and other insects, which before now have constituted a serious plague, proves that if once an undersized species outnumbers its natural small foes, the advantage of small size places them out of the reach of larger animals, and soon beyond the easy control of man himself.

The existence of many parasites is rendered possible chiefly by their small size. Again, microbes and bacteria may be taken as typical examples of organisms before whose invincible armour of minuteness, human skill, with all its resources, often stands impotent.

The importance of this question of size is shown in a significant light by the fact that the best, and sometimes the only weapon which man can wield against disease-germs, is the use of other organisms equally small, which have been rendered serviceable by domestication.

With these comparatively few remarks and instances we must close our brief visit to field and forest. If by this part of our investigation we have been enabled to perceive more clearly the actual causes for the survival of many apparently useless or injurious creatures, and have thereby escaped from confusing ideas and have seen organic evolution in its true character ; as the humble but sacred foundation-work of the Divine process of re-creation, our digression will not have been without solid gain.

CHAPTER III.

THE NATURE OF LIVING MOVEMENTS.

Contents.

	PAGE
A comparison between life and the physical forces . . .	252
Life cannot be produced artificially	253
Life cannot be increased or lessened by addition or subtraction	255
Organic growth is distinct from crystal growth . . .	258
Every living being constitutes a centre of control . . .	259
The great distinction	262
Two objections	263
The transcendent element	263
Is living matter potentially conscious?	264
Professor Virchow's ideas—Weismann—G. H. Lewes . . .	268
Kirchener—Professor Ward's views	275

CHAPTER III.

THE NATURE OF LIVING MOVEMENTS.

As has been already stated, the phenomena of evolution are so definite and strongly marked, that the origin and nature of living movements, whatever they may be, cannot substantially modify the facts put forward in the former pages.

But as a point of interest, and one which is really part of the subject before us, I propose to examine in a simple and brief manner, the evidence which bears upon the nature of living movements.

The question is, whether living movements are due to some combination of the physical forces, or whether they originate from an energy of a transcendent or spiritual nature similar to that which has always been called life, or vital force. As we have reason to believe that matter itself is in origin and essence spiritual, the distinction mentioned may appear unreal. Again, vital phenomena may be due to the joint action of several transcendent factors inherent in matter. The evidence of facts can only lead to truer understanding.

*A COMPARISON BETWEEN LIFE AND THE
PHYSICAL FORCES.*

Without pretending to make an exhaustive investigation into so broad a subject, it will be quite sufficient to show where the unique nature of life stands out in deep contrast to that of the physical forces.

First, living matter cannot be derived from any combination of that which is lifeless.

Secondly, life cannot be increased or lessened by addition or subtraction, nor can it be dealt with by transmission, as is the case with all kinds of physical energy.

Thirdly, the characteristics of organic growth present a strong contrast to all inorganic movements, including those of crystal growth.

Fourthly, every living being constitutes a centre of control unknown in the inorganic universe.

Fifthly, living matter is always in a perpetual state of change or metabolism, which is not found in the same condition in inorganic matter.

Let us now look at these points separately by way of judging of their reality.

(1) *LIFE CANNOT BE PRODUCED ARTIFICIALLY.*

As life has not been artificially produced, we are unable to assume the possibility of doing so. In order to establish the exact position of science in regard to this point, it will be sufficient to quote two authorities only. The late Professor Tyndall remarked :—"If you ask me whether there exists the least evidence to prove that any form of life can be developed out of matter, without demonstrable antecedent life, my reply is that evidence considered perfectly conclusive by many has been adduced ; and that were some of us who have pondered this question to follow a very common example, and to accept testimony because it falls in with our belief, we should also eagerly close with the evidence referred to. But there is in the true man of science a desire stronger than the wish to have his beliefs upheld ; namely, the desire to have them true. And this stronger wish causes him to reject the more plausible support, if he has reason to suspect that it is vitiated by error. Those to whom I refer as having studied this question, believing

the evidence offered in favour of 'spontaneous generation' to be thus vitiated, cannot accept it. . . . In reply to your question they will frankly admit their inability to point to any satisfactory experimental proof that life can be developed, save from demonstrable antecedent life."¹

The late Professor Huxley also, after carefully discussing the subject, sums up his opinion in the following words :—"For my own part I conceive that, with the particulars of M. Pasteur's experiments before us, we cannot fail to arrive at his conclusions; and that the doctrine of spontaneous generation has received a final *coup de grâce*."²

The writer of these words, however, still maintained that a belief in the physical origin of life should be held as an act of scientific faith.

Professor Verworn, in his *General Physiology*, discusses several interesting theories of the origin of life, but without reaching a definite conclusion.

The theory of cosmozoa, which supposes that

¹ *Fragments of Science*, vol. ii. p. 191.

² *Darwiniana Essays*, p. 390.

NATURE OF LIVING MATTER. 255

organic matter found its way to this planet upon a meteoric stone, is not only without evidence, but even if true, would afford no explanation of life, for the causes of its origin in another world would still remain a mystery. Nor again do we find help in the supposition that "life is derived from fire, and its fundamentals were laid down at a time when the earth was still an incandescent ball." ¹

(2) *LIFE CANNOT BE INCREASED OR LESSENE BY ADDITION OR SUBTRACTION.*

With regard to the second point of contrast, life appears to exist only in detached units, and no known or conceivable power can merge into one, the vital principles of several organisms.

This is a feature which becomes more apparent when life is compared with any physical force, such as heat or electricity. Although these forces exist in definite quantities according to the amount produced, yet this amount may be increased indefinitely by the simple addition of a further supply of the same force. But life

¹ *General Physiology*, p. 307.

is different ; no increase can be made to it by addition from an external source. Life in an organism is a detached unit of energy which may cause physical growth, and the expansion of muscular and nervous tissue, according to its inherent potentiality ; but the vital principle can never be increased by transmission from another being.

You may light fuel in a grate in different places, and when the separate fires meet, they will unite, each becoming greater by mutual addition. But no two quantities of life can be merged together.

When one living creature swallows another, the vital principle of the one does not add to the vital principle of the other. The material substance of the one may be increased by the material substance of the other, and although this may involve an additional capacity for the exhibition of some form of animal force, yet it does not mean an increase in the essential principle of life.

Life becomes extinct in the organism devoured, long before the material elements are assimilated

NATURE OF LIVING MATTER. 257

by the devourer ; and the resulting nutrition is precisely the same whether the food taken consists of living or dead matter.

Again, it would seem that life cannot be lessened by subtraction. A certain amount of indistinctness is connected with this truth, owing to the fact that some plants can be propagated from a part taken from the parent stem.

The animal world supplies similar phenomena in rudimentary organisms which may be divided, each portion becoming a complete being. In the case of polypes the natural increase is by budding off from the parent.

But in none of these cases is the vital principle of the parent organism diminished, nor is there any reason for supposing that here there is any genuine exception to what appears to be the indivisible nature of life. What actually takes place in these cases is probably an exactly similar process to that which occurs in the ordinary method of propagation by fertilized germ-cells. In both cases a portion of matter is removed from the parent organism, and before it has become devitalized, and before the organization

of its molecules has succumbed to the influence of decomposition, it is reanimated as a distinct centre of life. Thus the organized matter, no longer dominated by the vital energy of the parent being, passes like an empty house, as a nucleus of a new unit of life, to become a centre of organization and construction. These details are so obscure that conjecture is perhaps legitimate. The point which seems beyond doubt and which concerns us, is that in such cases there is no division nor diminution of the vital principle of the parent.

(3) *ORGANIC GROWTH IS DISTINCT FROM CRYSTAL GROWTH.*

The growth of a crystal is a definite process which is completed in the production of a structure of an unchanging design. But the growth of an organism is a process of such an exceedingly indefinite nature, that no living animal or creature can be said to present a final form.

In further contrast to the fact that crystal growth ends with the simple determination of a physical shape, organic growth, besides being

NATURE OF LIVING MATTER. 259

extremely complex, is also a cumulative process. The unit around which crystal growth forms, has no individual differentiation. The properties of every atom of the same substance are identical, and the resulting structures admit of no variation from the standard pattern. The unit of organic growth, however, is possessed of a great accumulation of individual differentiations.

Thus while thousands of years have passed without any change in crystalline forms, the extreme reverse is true of organic growth.

And yet again, crystalline growth is reversible. You can reduce your crystal to fluid, and again cause its growth as a crystal. But you cannot reduce the plant to the seed and again bring about its development.

(4) *EVERY LIVING BEING CONSTITUTES A CENTRE OF CONTROL.*

We have already referred at length to this significant feature of contrast between the organic and the inorganic.

We arrived at the fact that every living being constitutes not only a centre of existence and

motion, but also a centre of control. From this point we pass on readily to notice, that the possession of powers of motion and the capacity to control them, forms the basis of what is called conscious individuality.

Thus between the mechanical and the non-mechanical, there appears to exist a barrier of fundamental and essential distinction. On retrospect we can perceive more clearly than ever the difficulty of supposing that the physical forces could originate life.

How can we conceive it possible, that inorganic forces which have everywhere a common identical nature, which everywhere obey one external centre of control, could unite to create centres of life, each of which must have its own individuality, each with its own centre of control, each, moreover, organizing differentiated structures, each utilizing the uniform physical forces in diverse manners, and not only using them without reference to their natural inorganic tendencies, but playing off the various chemical and other forces one against the other, with the sole object of maintaining their own individual being ?

NATURE OF LIVING MATTER. 261

(5) *THE TRUE PROCESS OF METABOLISM IS ONLY FOUND IN LIVING MATTER.*

All living matter is continually in a state of change, the molecules being perpetually dissolved and reconstructed so long as the organism remains fully alive. This process has usually been admitted to be peculiar to living matter.

Professor Verworn, however, attempts to show that an identical process occurs in inorganic chemistry. The instance in question is the behaviour of nitric acid in the production of concentrated sulphuric acid.

In this example, under the constant entrance of fresh air and water, "the nitric acid is constantly reformed from the nitrous acid, so that the molecules of the nitric acid are continually being alternately broken down with the loss of oxygen and built up by absorption of oxygen."¹

It is clear that although this is a genuine example of chemical action, it is a process of a radically different nature from the varied and ever adjustable movements of organic metabolism.

¹ *General Physiology*, p. 125.

THE GREAT DISTINCTION.

Now surely if the lay mind is guided by facts and reason, it would seem that the above contrasts afford very solid ground for the belief that there is a real and essential difference between the organic and the inorganic.

But we are at once confronted by the question, How can life be an energy of a nature different from the physical forces? Does any other kind of energy exist?

The reply is, that whether the distinction is real or not, we can, and do, naturally recognize two kinds of "energy," the mechanical and the conscious,—the physical and the psychical,—the inorganic and the organic. But life cannot accurately be called a form of energy, although, for the want of a better term, this name may be admissible.

But is the opinion which holds life to be essentially distinct in nature from all physical energy, true?

It is certainly one of those impressions which are as deeply ingrained in the human mind as any result of experience could be. But will the

NATURE OF LIVING MATTER. 263

distinction stand the glare of reason and cross-questioning, or will it shrivel up into nothing ?

Have sound and careful observers, educated in scientific methods, adhered to this distinction ?

And what weight of fact, reason, or theory is there against its reality ?

It appears that there is not one single grain of positive evidence showing the identity of these energies, whilst we shall see that there is the greatest difficulty in bridging over the gap if this distinction is ignored.

TWO OBJECTIONS.

There are two great objections to the acceptance of this distinction :—

First, the prejudice against recognizing any transcendent element in nature.

Secondly, the difficulty of allowing that living matter, in its primary phases, is potentially conscious and possessed of definite receptivities.

THE TRANSCENDENT ELEMENT.

With regard to the first objection, it has been already dealt with. If the presence of this element

must be acknowledged in the higher phenomena of thought and religion ; it would seem useless to insist upon its absence in the more rudimentary phenomena. If the factor be entirely denied, nothing further can be said upon the grounds of reason and fact.

IS LIVING MATTER POTENTIALLY CONSCIOUS ?

It may be no easy task to realize that in its lowest form living matter is potentially conscious ; but the journey from the tiny speck of protoplasm to the fully conscious animal, in the ontogeny of the individual, does not admit of anything but a gradual development of potentialities.

Thus the life-history of the human individual from the embryo to maturity, may be taken as a more or less complete exhibition of a gradual manifestation of consciousness, from the zero level of the human germ, to the full development of intellectual manhood.

In this process of continuous unfolding, we have a proof that there is no real barrier between living matter which scarcely shows any signs of

NATURE OF LIVING MATTER. 265

vitalization at all, and that which has become the medium for displaying complete consciousness ; but that life in all stages of manifestation is an energy of the same potentially conscious nature.

If we turn to the lower levels of the world of nature, many obscure movements will be found which partake of a subconscious or partially conscious nature. Although plants possess no material nervous organization, they perform movements of a purposeful nature. Darwin remarks :—"I believe that there is no structure in plants more wonderful, so far as its functions are concerned, than the tip of the radicle. If the tip be lightly pressed or burnt or cut, it transmits an influence to the upper adjoining part, causing it to bend away from the affected side : and, what is more surprising, the tip can distinguish between a slightly harder and softer object, by which it is simultaneously pressed on opposite sides. . . . In almost every case we can clearly perceive the final purpose or advantage of the several movements. . . . It is hardly an exaggeration to say that the tip of the radicle thus endowed and having the power

of directing movements of the adjoining parts, acts like a brain of one of the lower animals.”¹

The question of consciousness is greatly obscured by the fact that many of the motions which take place in conscious beings have sunk beneath the surface of conscious volition and have become unconscious or reflex.

Upon this point Romanes remarks :—“ It is certain that no adaptive action of quite a novel kind is ever performed from the first without consciousness of its performance, and therefore, although it is true that by repetition its performance may become mechanical or unconscious, this does not prove that consciousness was without use in producing that adaptive action. It only proves that after a nervous mechanism has been elaborated by the help of consciousness, consciousness may be withdrawn and leave the finished mechanism to work alone ; the structure having been completed, the scaffolding necessary to its completion may be removed.”²

Professor Cope, referring to the same point,

¹ *Movements of Plants*, p. 572.

² *Mind, Motion, and Monism*, p. 74.

writes :—"The fact that the process may now be reflex does not exclude the other fact of the influence of consciousness at the inception, and its necessity for the continuance of the habit."¹

Then in view of the varying and frequent phenomena of consciousness, the question arises, Does this element arise from the matter which is vitalized, or from the energy which vitalizes? We can hardly suppose that it is a property emanating from *inorganic* matter, since it is conspicuously absent wherever inorganic matter alone is found, whilst it is invariably present in its ultimate essentials of a centre of existence and control, in the lowest forms of life. In short, the facts of nature seem to insist that the phenomenon of consciousness is not due to matter, but to the element by which it is vitalized.

But what then is the ultimate nature of life?

Of the actual nature of this energy we know no more than we do of any other kind of force, that is to say, absolutely nothing. For all outward observation can decide, there may be a complexity of transcendent energies beneath the

heterogeneous mass of living movements. But the one fact which seems to be borne out by evidence from so many quarters, and which should not escape our notice, is, that living movements are not a *little* different from *some* lifeless ones, but are diametrically opposed in some characteristics to *all* of them.

Let us now turn to another aspect of the subject, namely, to the opinions of those who find no reason for believing in some such energy as life. These views are more easily based upon negative than positive facts. Suppositions which attribute vital origins to the action of ferments of an *apparently* inorganic nature, only land one in obscure changes of matter.

But let us see how living manifestations can be explained without recognizing some such factor as life.

PROFESSOR VIRCHOW'S IDEAS.

Let us turn to Professor Virchow's Huxley Lecture for 1898, which may be taken as the ablest possible exposition of the views in question. The following quotations are taken from

NATURE OF LIVING MATTER. 269
the *British Medical Journal* of October 8th,
1898.

After tracing out the past history of biological knowledge, the Professor remarks:—"The greatest difficulty in biology has arisen in this way—that mankind, following a natural tendency, has set the search after the unitary basis of life in the foreground of its consideration. As a matter of fact, what is more natural than the conclusion that life, as a special phenomenon, must have also a special basis, and the material process of life must be derived from a common cause? During the last century an attempt was made to satisfy this claim by the assumption, with an ever-increasing conviction, of a special force,—vital force. Nowadays we can still perceive the logical errors which this error rendered possible. Time has, however, passed judgment upon it, and to-day no one continues to speak of vital force. And yet the necessity for a single basis of all vital manifestations remains. How is this to be satisfied?"

Professor Virchow then attempts to satisfy this necessity by the following explanation:—

“As regards material construction, man and the higher animals and plants are no unitary, simple beings; on the contrary, they are put together from many units. They are hence called organisms.”

It will be here noticed that in the vague phrase, “they are put together,” there is a postulation of the very force in question.

What is the energy or cause which organizes or “puts together”? This postulation is not merely a matter of language, for an organism is so named by virtue of this putting together or organization of parts into a unity.

The Professor then continues:—“How can a single power, whether we call it, in the spiritualistic sense, spirit, soul, *spiritus rector*, or in the physical sense, vital force or electricity, build up such diverse organisms?”

Could we imagine the possibility of a highly organized social organism coming into existence, without some centre of control, from which a directive force emanates with sufficient power of rule and organization to regulate and determine the relationships of the component units?

NATURE OF LIVING MATTER. 271

But what, as a matter of fact, is the basis of vital manifestation which is put forward in the place of life ?

Mere co-existing cells.

The argument is, that cells formed of lifeless matter, unite (why and under what conditions, we are not told), and the result is, living organisms.

To give Professor Virchow's own words :—
“In a medical school where the teaching is almost exclusively concerned with human beings this sentence should be writ large :—‘ The organism is not an individual, but a social mechanism.’ Two corollaries must also be stated—(1) that every living organism, like every organ and tissue, contains cells ; (2) that the cells are composed of organic chemical substances, which are not themselves alive.”

Here in the place of a vital energy we have cells, as “factors of existence.” These cells, we are told, are composed of organic substances, which substances are not themselves alive.

But if the organic matter is lifeless, the cells are at any rate alive. Then how does the life-

less matter become living as we find it in the cells?

Here again is the need of the same element.

From these gaps it would seem that the task of explaining living manifestations without the aid of some organizing energy, is one not only of difficulty, but of apparent impossibility.

It is somewhat of a relief to move from this shaky ground, and to accept the definite expression of Hunter, that "life is the cause, and not the consequence of organization."

But before passing on, let us examine two aspects of Professor Virchow's ideas of living beings. If it be true that what we call the individuality of a human being consists merely of the social community of the cells which form his body, then the removal of a limb or a large portion of the body would inevitably alter and to some extent impair the individuality.

The facts of nature offer here a blank contradiction.

A man may lose all his limbs, or be born without them; possessing merely the trunk of the body; and yet this abnormal or mutilated

NATURE OF LIVING MATTER. 273

“social mechanism” will in no way affect the normal individuality of his being.

Again, wasting disease may cause a diminution in the tissues of every organ and muscle throughout the body, leaving the remaining cells so weakened that the “social mechanism” is an absolute wreck of its former self ; yet the unity of being, and those personal characteristics which were present when the organism was healthy, remain practically unaltered—a proof that cellular bulk and cellular condition do not constitute individuality.

The fact that living manifestations are so intimately associated with matter and the physical forces, developing so many different forms of animal energy, renders the subject a quagmire for confusion of thought and expression.

The following sentences show that Professor Weismann has not always escaped the snare. He remarks :—“ We can, indeed, kill all organic beings and thus render them inorganic at will. . . . When we pour sulphuric acid upon a worm, or when we burn an oak-tree, these organisms are not changed into some other animal or tree,

but they disappear entirely as organized beings and are resolved into inorganic elements. But that which can be completely resolved into inorganic matter must have also arisen from it.”¹

Now this is a remarkable example of circular reasoning, for the objects which the Professor can resolve into inorganic elements are not living animals, but dead ones. The process of killing which must necessarily precede the resolving into inorganic elements, means removing life, that very factor which is supposed to be converted into dust and ashes. As a point of fact, it is obvious that no living being can be resolved into inorganic matter, for the simple reason that long before the process of resolving has made headway, the organic being is no longer in existence; life has vanished, and all that remains to be resolved, is the bodily substance minus the living element.

Professor Weismann evidently was not satisfied with his argument, for he adds:—“Yet who can maintain that he has discovered the right answer to his important question? . . . How can we conceive that dead inorganic matter could have

¹ *Weismann on Heredity*, vol. i. p. 35.

come together in such a manner as to form living protoplasm, that wonderful and complex substance, which absorbs foreign material and changes it into its own substance, in other words grows and multiplies ? ”¹

Upon the same subject Kirchener remarks :—
“The unity and connections of the organism cannot be in the individual substance or processes, but only in the power that harmonizes them. Whether this vital power is called plastic soul or vital force ; its existence is as little to be disputed as that of the mechanical and chemical forces.”²

But why imagine that vital phenomena must be due either to physical causes or else to *one* other form of energy ? Who can thus limit possibilities ? Revelation teaches that co-operating agencies are at work behind living matter.

But to continue our examination of various opinions :—Speaking of the late Mr G. H. Lewes’ reference to vital force in his *Problems of Life and Mind*, the late Duke of Argyll remarked :—

¹ *Weismann on Heredity*, vol. i. p. 35.

² *Psychology*, p. 142.

“The objection made by a well-known writer, that we might as well speak of ‘watch-force’ as of a ‘vital force,’ is an objection which has no validity, and is chargeable with the great vice of confounding one of the clearest distinctions which exist in Nature. The rule which should govern language is very plain. Every phenomenon or group of phenomena which is clearly separate from all others, should have a name as separate and distinctive as itself. The absurdity of speaking of a ‘watch-force’ lies in this—that the force by which a watch goes is not separable from the force by which many other mechanical movements are effected.”¹

Last, but by no means least, let us turn to Professor Ward’s interesting pages. Speaking of the life in its connection with environment he remarks:—“On looking at this relation of organism and environment more closely, we discover that it is essentially an antagonism. Whether living or dead, the organism is equally a material system, and its *death* makes no change in what we may call the attitude of the environ-

¹ *Unity of Nature*, p. 36.

NATURE OF LIVING MATTER. 277

ment. What this attitude is, is therefore shown by the processes that then ensue. These processes, one and all, belong to the downhill trend characteristic of inorganic changes; adopting, but somewhat extending, a convenient physiological term, they are *katabolic*. Imagine an organism reduced at length by these processes to a formless aggregate of its elemental constituents. Now imagine this formless aggregate of dead material led back step by step till the living organism is set up once more, and you realize the antagonism between organism and environment. For the processes of organization that preceded death were the precise opposite of all that follow it; they reversed the dissipative tendency of inanimate matter; in a word, they were uphill processes of guidance and direction—they were *anabolic*. . . . We see the hopelessness of regarding this environment which itself is not alive, which antagonizes life, as possibly itself the source of life. Neither can we assume a specific vital energy or force, as the old vitalists did; for life has not—so far as we can see,—the properties of a definite form of energy.

Thus, when life disappears, there is no equivalent amount of other energy appearing in its place which we might regard as the result of its transformation. We cannot call death a form of energy. Life, in short, seems to consist in the guidance and control of the known forms of energy, molar and molecular. Quite possibly, beside them, there may be unknown forms of energy, but hardly, as commonly understood, such as would explain life itself. For energy—unless there be what might be vaguely called higher forms of it—is directionless, and all physical forces, so to say, katabolic.”¹

In conclusion then, it would seem, that it is impossible to explain the facts of living movements without recognizing the presence of *some unique* factor differing as widely from the physical forces as the organic and inorganic differ in their most pronounced contrasts.

The old idea of vital force may be hopelessly in error, but with it goes the only hypothesis which, at any rate,—however vaguely—does at least account for that mysterious individualized organ-

¹ *Naturalism and Agnosticism*, vol. i. p. 290.

NATURE OF LIVING MATTER. 279

izing element which manifests itself in the strange forms and phases of living beings. There is of course an ever-present possibility,—some would say a strong probability,—that the distinctions enumerated above are apparent only, and not real. Doubtless mind lies beneath all matter, and if mind, why not life? This view still further enhances the spiritual aspect of evolution, since it demands the factor of Divine Immanence. The recognition of the primary power of will and mind, whether for good or the reverse, renders the introduction of the element of evil still more intelligible. It casts further light upon the contradictory phenomena of good and evil results, results so ubiquitous, so varied, but always in such intimate association with each other.

Then the scientific description of the actual nature of living matter may well be left to the possibilities of future knowledge. We may, however, rest assured, that when this mysterious problem is solved,—if it ever is solved by material investigation,—the main aspect and truths of evolution will remain unaltered.

PRINTED BY
NEILL AND COMPANY, LIMITED,
EDINBURGH.

45

2



JAN 20 1930

